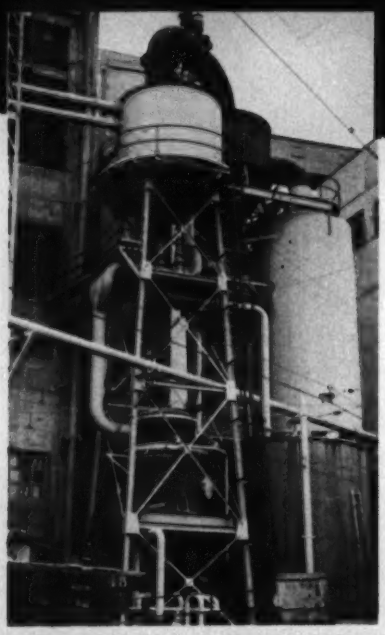
Paper
TRADE JOURNAL

JUNE 8, 1951

HOW CAN WOOD RESIDUES BE UTILIZED?—
SEE PAGE 20.

WOULD A CAISSON WELL SOLVE YOUR WATER SUPPLY PROBLEM?—
SEE PAGE 18.

Controlled Digester Blow Heat Recovery Provides at Constant Temperature



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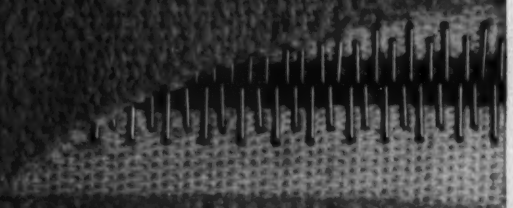

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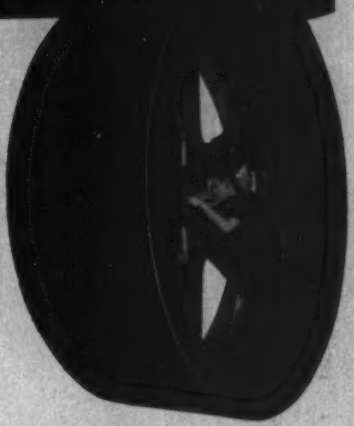

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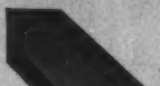

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FOR THE PAPER INDUSTRY

Paper TRADE JOURNAL

VOL. 132 JUNE 8, 1951 No. 23

NEXT WEEK

An extremely interesting and informative account of the digester corrosion problems encountered in an Australian Pulp Mill will be found in "Failure of a Pulp Mill Digester" by W. T. White, Chief Metallurgist, Australian Paper Manufacturers, Ltd.

Number IV in our series of Maintenance articles, "How to Get The Most Served From Rubber Covered Rolls" by Alfred C. Lutz, Roll Sales Engineer, B. F. Goodrich Co., provides valuable information on a subject of great importance to all paper mills.

FEATURES

	Pages
Newsprint Up $10	11
Empire State Program	13
Government Gospel	14
Four Million GPD from Single Caisson Well	18
Manufacture of Consolidated Products From Wood Residues	20

DEPARTMENTS

Our Business	7	Prices	31
Trends	9	Materials	32
News of the Week	11	New Equipment	32
People	12	New Materials	36
Associations	13	Production	38
Industrial Section	18	New Literature	38
Patents	28	Obituaries	38
CLASSIFIED ADVERTISING	39	ADVERTISERS INDEX	50

REMEMBER THESE DATES

JUNE 18-22: American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

JUNE 22-23: The Paper and Twine Assn., Anual Meeting, Golf Tournament and Convention at French Lick Springs Hotel, French Lick, Ind.

JUNE 22-23: Maine-New Hampshire Section of TAPPI, meeting to be held at the Eastern Slope Inn at North Conway, N. H.

JUNE 24-28: American Pulp & Paper Mill Supts. Ass'n. National Convention, to be held at the Multnomah Hotel, Portland, Oregon.

JUNE 27-30: Empire State TAPPI, meeting at the White Face Inn, Lake Placid, N. Y.

SEPT. 16-19: American Institute of Chemical Engineers, Regional Meeting, French Lick, Ind.

OCT. 10-12: American Pulp & Paper Mill Superintendents Assn., Southern and Southeastern Div's., George Washington Hotel, Jacksonville, Fla.

Oct. 29-31: National Foreign Trade Convention, Waldorf Astoria, New York City.

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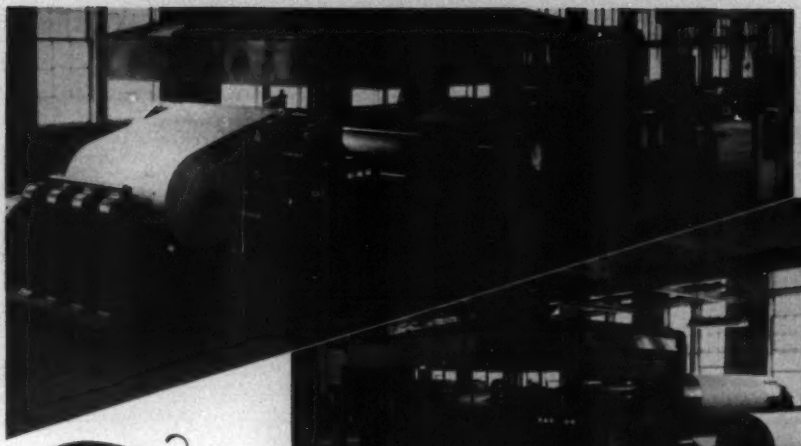

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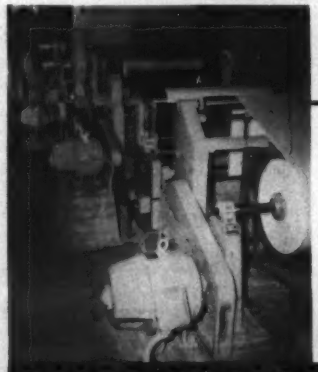

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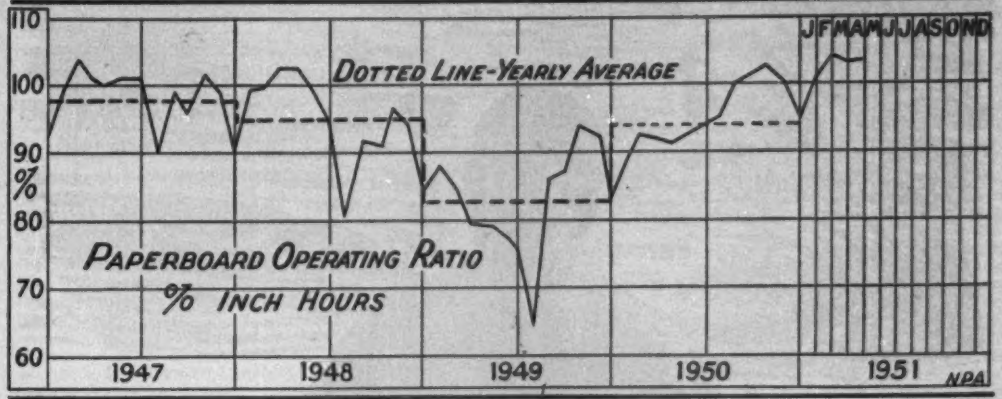
DILTS DESIGNS FOR PRODUCTION PROFITS



Weekly Brief of Important Figures

Source	Production	WEEK ENDING May 26, '51	Apr. 28, '51	May 27,'50
APPA	Paper Production Percent Capacity[3]	104.1	101.5	97.3
	Unbl. Kraft Paper Production Percent	99.1	89.0	99.2
NPA	Paperboard Operating Ratio Percent Inch Hours	102	105	93
		Apr. 1951	**Mar. 1951x**	**Apr. 1950**
APPA	Paper Production* (Except Newsprint and Building Papers) ....Tons	831,500	911,574	774,000
	New Orders ....Tons	857,000	959,757	779,500
	Unfilled Orders ....Tons	964,636	932,996	543,100
	Shipments ....Tons	824,000	911,448	768,000
		Apr. 1951	**Mar. 1951**	**Apr. 1950**
NPA	Paperboard Production ....Tons	1,006,972	984,405	858,300
	New Orders ....Tons	956,085	946,819	847,100
	Unfilled Orders ....Tons	646,878	704,936	343,700
	Our Customers Activities Index[1]	**Latest Mo.***	**Previous Mo.***	**Year Ago***
FRS	Manufactures Total Index	230	228	191
	Durable Mfg. Index	274	268	210
	Nondurable Mfg. Index	194	195	177
	Chemical Products Index	294	291	250
	Mfg. Food Products Index	149	148	148
	Printing and Publishing Index	178	175	172
ODC	Magazine Advg.-Printer's Ink Index	343	344	328
	Retail Sales Combined Adjusted Index	342.9	356.6	308.1
	Drug Index	240.3	248.1	221.3
	General Merchandise Group Index	318.4	347.3	291.8
	Grocery and Combination Index	432.7	427.6	377.3
	Prices Index			
BLS	Consumers Price Index[1]	184.5	183.8	168.4
	Wholesale all Commodities[2]	184.0	183.6	152.7
	Wholesale Foods[2]	186.6	187.6	155.5
	Commodities other than Farm Products and Foods[2]	172.4	171.8	146.1
	Wholesale Pulp and Paper[2]	196.3	196.5	155.5
	Purchasing Power of Dollar, Consumers Prices[1]	54.2	54.4	59.4
	General Activity Index			
FRS	Mfg. Production-Worker Payroll	429.4	423.7	333.5
	Unemployment Compensation Initial Claims (M)	729	770	1,294
	Miscellaneous Carloadings–Thousands of Cars	1,373	1,498	1,688
	Electric Output (Million KW hr.)	36,172	33,102	31,864
PTJ	Average 32 P & P Common Stocks as of May 29	$37.74	$39.59	$34.51
	Average Indicated Dividends Common Stocks as of May 29	2.54	2.54	2.32

[1] 1935-39=100 Unadjusted Index
[2] 1926=100
[3] New 6-7 day basis.
* For details see APPA Monthly Statistical Summary—April 1951 Estimated Figures
* Latest Month Available on Request
x Revised figures.

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Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL, Wednesday, June 6, 1951.

Getting the bent of market conditions nowadays is somewhat akin to unraveling Life's mysteries. There are *endless* leads: first in this direction, which some interests would like to see developed; then in that direction, which others want to believe; and each is right until one has heard the other side of the story. Calibrated against historic curves of supply and demand and against accepted patterns of self-interest, a few fragments appear to be *news*.

The "Price War"

Take, for example, today's headlines: the so-called price war which currently is spreading from New York's department stores to San Francisco's with minor eruptions in the mid-west. It points to the willingness of department stores to make use of the fair trade pricing decision to stimulate consumer buying. Which headlines the shift to a buyer's market where prices were cut—on many items below cost. Also it tells of an opportunity grasped to move topheavy stocks of other items at regular prices, while buyers were on a spree.

To press time, there were indications that the carnival spirit had spent itself. Buying is little above normal, and many market students see the net result as another dip in demand from this new wave of forward buying.

A disputed fact in market reports has been whether the volume of department store buying had seriously been cut during the Spring. Dollar volume is only a little below that of a year ago. Measured against the mountainous inventories, the dip in consumer buying has been serious. And the WHY in price-cutting is said to lie in the tremendous overall gains in manufacturing — which averaged 20 percent over for the first four months of 1951, compared against 1950's period. Department store stocks for 350 leading stores were reported at 30 percent over 1950's, with a 49 percent overall gain in homefurnishings, (91 percent in appliances, 202 percent in TV, radio, etc.); men's wear 28 percent; women's apparel and accessories 19 percent (hosiery 46 percent); small wares 20 percent; fabrics and bedlinens 35 percent; toys and sporting goods, etc., 45 percent.

So far as the fair trade pricing issue itself is concerned, doubtless some good will come of the "price war." Much bitterness reportedly exists among the manufacturers of "branded" items, which may be softened by a look at the healthier inventory positions of their distributors and outlets.

The Supreme Court judgment which initiated the decision to cut the prices which started the buying to move the stocks was *Simon pure coincidence* — an opportunity that needed to "knock but once" on Broadway's revolving doors.

Its Effect on Coarse Papers

Another fact difficult to track down is the actual condition of wrapping materials in department stores. Reports differ widely. Mostly it has been said that these paper stocks are no more than a 30-days' supply, though corrugateds and liners are in better position.

Considerable stimulus to department store coarse paper buying should either result from the buying jamboree, or these stocks will be allowed to stay at current levels during the quiet of summer shopping. The true condition of these stocks should soon become apparent.

Canadian Newsprint Price

Announcement by a major Canadian newsprint producer that, effective July 1, his price will be $10 a ton higher—or $116 delivered New York—took the market here and in Canada by surprise, it is reported.

Increasingly the subject of national and international discussion, the price of newsprint was not generally expected to react to either the law of supply and demand or to the much higher cost factors.

Indications are that other Canadian companies are considering a price rise. At press time, three more producers had announced a similar price advance.

Protests against the rise were lodged with Price Administrator Di Salle by Senate members who labeled the rise "an unwarranted gouge" and "additional tribute." The OPS is understood to have hoped the rise would be deferred for some time, but said they were notified of the planned increase by Canadian Production Minister Howe on May 31. Canada's Department of Defense Production said that production costs was one of the facts involved in the rise and that it had decided not to intervene.

Raw Materials

Though few admit it, there is unmistakably a let-up in the pressure of demand for papers, boards, and products thereof. The consensus is that demand is steady and that allotment deferments are only spotty; but that most of the shipments are going into inventory; that when these consumer stocks are big enough, demand will soften—barring a new wave of buying.

This same reasoning extends into raw materials also, with the result that a few spots of softening have appeared.

Notably this softening has come in groundwood pulps. At this season of the year, when water is swift and plentiful, groundwood pulps and waste paper substitutes are in much easier supply.

Mill stock adequacy on kraft pulp substitutes is spotty, and the price of 100 percent kraft cuts is slightly softer.

The scrap bagging market has seen no upturn in buying interest, and is reported as dull. Price resistance is a factor, it is said.

Old Corrugated Lifts Again

New lifts in the mill buying prices of old corrugated containers this week brought the levels close to ceiling prices, which the *Journal's* record shows at $64/$70 for New York's market as of January 25 price freeze. Collections of old corrugated are not keeping abreast of demand, the industry reports, and the situation is looked on as serious.

Speaking for Eastern board mills, the Eastern Conservation Committee says the mills were able to purchase only 92 percent of all the old corrugated they consumed.

Mr. Baker urges dealers, packers and collectors throughout the East to reactivate their supply sources.

Old Manila Tab Cards Needed

Also urged by ECC is the need for old manila tab cards, ledgers, and other high grade, pulp substitutes. Manila tab cards are in extremely short supply and could be made available if business generally were to dispose of old records.

Third Quarter Pulp Prices Due

Announcements of market pulp prices for the third quarter are scheduled for early release.

Within the trade, it is not expected that any price announcements will be made until OPS decisions on price ceilings are released.

There is much talk about what is coming and little known. Spoken of is a ceiling of $145 for domestic bleached sulfite, $150 for bleached kraft, and $137.50 for unbleached kraft. Imported grades probably will be set at $225 for bleached grades and $200 for unbleacheds, it is said.

Swedish producers are said to have asked OPS for a ceiling of $225 for unbleacheds and $250 for bleacheds, and to have gained a point. Later rebuffed, they are now urging U. S. mills to persuade Washington that a cut-off in their third-quarter allotments is at stake.

Consumer resistance to Swedish high prices has strengthened where mill inventory position permits, a fact the Swedes know well from tonnage rejections of the second and third quarters. They also know that the small and marginal mills need pulps, and that they want to hold the U. S. market.

A lot more is wrapped up in this issue than meets the eye, it is reported. This appears to be one of those battles where everything is adjudged *fair*.

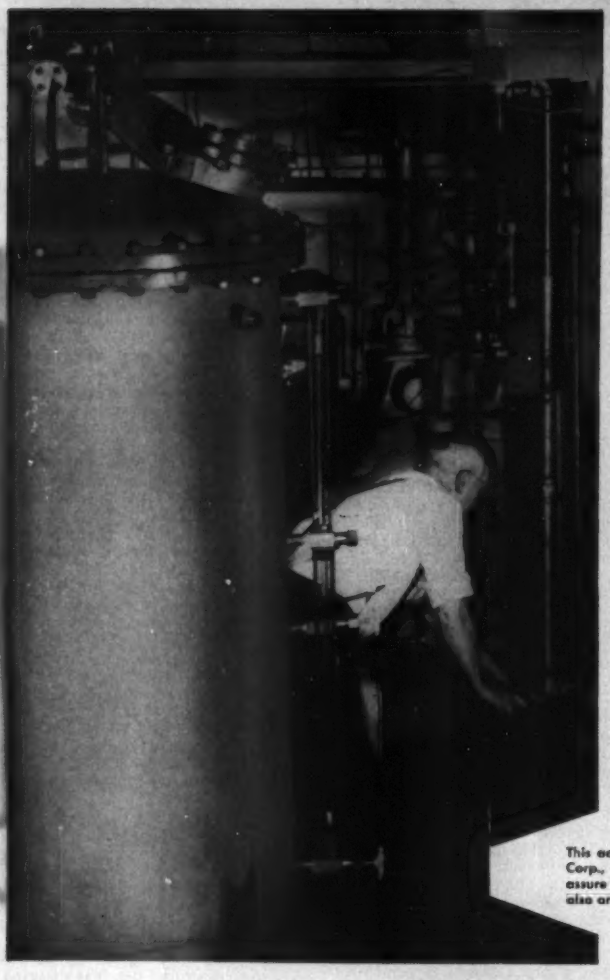
—E. P. N.

Paperboard Production (Tons)*

	May 26 1951	May 19 1951	May 27 1950
Production	244,917	257,930	209,350
New Orders	209,194	206,161	187,300
Unfilled Orders	638,760	680,103	333,486

* Source: NPA.

MADE TO LAST... it's Stainless Steel



HOW MANY TIMES during recent months have you stopped in front of a vital piece of equipment and said to yourself, "I'm glad it's Stainless Steel"?

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Include Stainless Steel equipment in your plans for future improvements. By using U·S·S Stainless Steel, you can make sure you get a perfected, service-tested material that has proved unsurpassed for keeping equipment on the job.

This acid tank at the Pulp Mill Pilot Plant of Eastern Corp., Bangor, Maine, is made of Stainless Steel to assure long, trouble-free service. Piping and valves also are Stainless Steel.

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UNITED STATES STEEL

News of the Week

Paper TRADE JOURNAL

NEWSPRINT UP $10

OTTAWA — The action of Abitibi Power & Paper Co., Ltd., to increase the price of newsprint by $10 a ton may lead to other boosts by other companies. Trade circles already are terming the new increase as only a "modest advance" considering the rising costs of production in the industry.

With newsprint now designated by the Canadian Government as an essential material and a Pulp and Paper Division operating under the Defense Production Department, Production Minister Howe's statement that the Canadian Government had been informed of the proposed increase and had decided not to intervene is considered significant, especially since the Minister has indicated that production costs were a factor. Abitibi Power & Paper Co., Ltd., has attributed the boost, in part at least, to a recent increase of 14 percent in wages paid to its employes.

Since Abitibi Power & Paper Co., Ltd., produces annually about 700,000 tons of newsprint and is the third largest Canadian newsprint producer, it is believed that other boosts may be on the way, even if some producers are known to be undecided as to how much to raise their prices. Most companies are refusing to commit themselves as to if and when their newsprint prices will increase. They apparently are undecided about the amount more than the policy of raising prices. It is pointed out that newsprint prices in Canada have been quite uniform with most mills so that it is unlikely that prices will be increased by as much as $10 a ton by some companies and remain unchanged for others.

Indicative of one of the main reasons for this latest increase is the disclosure by the Canadian Government that the payrolls of paper products manufacturers throughout the country advanced to 377.0 at March 1 this year compared with 376.9 at February 1 and 321.0 at March 1 a year ago, on the base of 1939 being 100. Besides payrolls, the manufacturers are now paying more for most other essentials required in their operations, including freight.

BROWN CONSTRUCTION

Brown Co. plans to spend $10 million to modernize its mills in 1951-52. This newest expenditure will bring to $30 million the total already spent or allotted for its postwar modernization and expansion program. Ground was broken in early April for their new Floc plant, with the excavation now nearly completed and engineers ready to pour the concrete foundation to be erected near the old mill. The new project, directed by Norway Johnson, Engineering Department will consist of a new and modern reinforced concrete, brick and steel constructed building. Morton C. Tuttle, Boston, is doing the actual construction.

ABITIBI'S NEW STOCK ISSUE

OTTAWA—Directors of Abitibi Power and Paper Co. have authorized a $10 million ten-year 4½ percent convertible debenture issue. The debentures will be convertible into common stock on the basis of four shares per $100 without premium in the first four years. In the next three years a premium of $2.50 a share will be payable on conversion and in the final three years the premium will be $5 a share.

The debentures will be publicly offered by a large group of investment houses and the underwriters have been asked to give preference to the subscription of common stockholders of the company.

NEWFOUNDLAND MILL PLANS

OTTAWA—The Government of Newfoundland is planning to conclude negotiations for the possible construction of a third newsprint mill and a new pulp mill in that area of Canada this year. It is understood considerable progress in such negotiations have been made.

Newsprint in Brief

WASHINGTON, D. C. — Rep. Celler (Dem., N. Y.) has called upon OPS to set "just and reasonable prices" for newsprint as a result of Abitibi's announced $10 increase.

Michael Di Salle will appeal to R. M. Fowler, Newsprint Controller of Canada, to hold the line, as any weakening of the U. S. price structure will adversely affect Canada.

Senator Edwin C. Johnson (Dem., Colo.) is quoted as denouncing the rise as a price gouge. The Rifle Colorado paper project has been granted a certificate of necessity of approximately $16 millions. Originally planned as a newsprint project it is reported to have shifted to market sulphate pulp.

The current price of newsprint is $106, New York; bleached sulphate pulp contract price is $135-$200.

Consolidated Paper Corp., Ltd., also has announced a $10 rise as has Canadian International and the Anglo group.

NEWSPRINT FOR BRITAIN

OTTAWA—A statement by Lord Layton, chairman of the British Newsprint Supply Co., in Montreal, referred to a deal negotiated with Canadian mills, which may lead to Britain getting from Canada next year almost the same quantity of newsprint as in normal years, some 80,000 to 100,000 tons of newsprint a year, instead of only 20,000 tons received last year.

The statement by Lord Layton indicates an agreement between the British Newsprint Supply Co. and the Canadian mills will be based on a program of supply for the next three years. In some trade quarters, it is believed that even more newsprint may go to Britain as a result of this agreement if Canadian production and world demand will allow.

Of course, it is also pointed out that Canada is likely to abide by any decisions which may be reached by the ten-country international control group in Washington where it is expected that overseas countries shall be helped in getting urgent supplies of newsprint, especially for some countries whose supply position is reaching a critical stage. Canada's contribution may come out of the increased output anticipated for this year, from 5,279,000 tons to 5,450,000 tons. It would not be a large quantity and it may not affect Canadian shipments to domestic customers or the United States as originally believed.

Meanwhile, it is learned that Canadian newsprint suppliers are getting "feelers" from several foreign countries about possible deals for newsprint, even in small quantities, including barter offers for goods which Canada urgently needs in her defense program. Holding up any decision may be attributed in large measure to the desire on the part of producers in Canada to find out what the ten-country international control group plans to do.

MEAD TO BUILD NEW MILL

Al H. Mahrt, vice-president, The Mead Corp., Dayton, Ohio, and president, Macon Kraft Co., Macon, Ga., announced that Rome, Ga., has been selected as the location for a Kraft container board mill.

Mead was recently awarded a Necessity Certificate by the DPA for the construction of a Kraft container board mill estimated to cost over $21 million.

America depends on

PAPER

IMAGINE!!!

that a supplier feels it necessary to tell the people. How long will it be before the industry runs with the ball that Beloit has thrown?

HOWARD SMITH FLOATS ISSUE

OTTAWA—A new issue of $6,500,000 Howard Smith Paper Mills Ltd., 4½ percent debentures, series A, has been sold. The debentures will be dated June 1, 1951, and will mature June 1, 1961. They were offered at 100 and accrued interest to yield 4.50 percent.

A sinking fund will be created sufficient to retire $650,000 principal amount each June 1, 1954-60 inclusive.

POLLEN FLOWN OVERSEAS

RHINELANDER, Wis.—Wisconsin tree pollen is flying (via air mail) all the way to Europe to give Europeans a better kind of poplar tree.

J. H. Stoeckeler, forester of the northern lakes forest research center here, said that tree breeders in Holland and Norway especially want pollen from the quaking aspen, native to Wisconsin. When this tree—a poplar with soft white wood and leaves that flutter in the lightest breeze—is crossed with the northern European aspen, an excellent hybrid results. Stoeckeler saw specimens in Sweden which grew four times as fast as native European aspen and had better resistance to leaf disease.

HANKINS CONTAINER OPENS

The new Hankins Container Co. plant has been officially opened in Elmira, N. Y. In Elmira for the opening were chairman of the board, E. R. Hankins; K. A. Bennett, company president; R. C. White, secretary, all of Cleveland; O. W. White, vice-president, of Chicago; Arthur Lockwood, vice-president, Miamisburg, Ohio; W. L. Davis, vice-president, and E. V. Hart, sales manager, both of Union, N. J.

FORM YEMASSEE PULPWOOD CO.

SOCIETY HILL, S. C. — Yemassee Pulpwood Co., with principal office here, has filed application with the Secretary of State for a charter. Authorized capital stock is $15,000. The incorporators include P. L. Gardner and Joe Chapman.

BROWN NAMES COLONIAL

Colonial Paper Co., Boston, Mass., has been appointed a distributor of L. L. Brown's Linen Ledger, Forward Ledger, Greylock Ledger and Advance Bond.

WHERE DOES PAPER GO?

Pratt Institute requires 48 lbs. of paper forms to process a student through graduation. As one father also reported, add to this the folding money and checks.

NO SUNDAY WORK FOR QUEBEC

OTTAWA—The proposal that workers in Canadian newsprint mills should work on Sundays in order to help relieve the world's newsprint shortage has not met with favor in the Province of Quebec where Premier Maurice Duplessis has hinted that this will not be tolerated in that area.

CLEAR WAY FOR AMERICAN BOX

The American Box Board Co.'s plans for a seven million dollar expansion program at Filer City, Mich. received the approval of the Michigan water Resources Commission. The company may use more water from Manistee Lake, but is prohibited from allowing the dissolved oxygen content of the lake and the Big and Little Manistee Rivers to drop below five parts per million, the amount considered necessary to insure fish life.

PEOPLE

DAVID H. ROSS, president of Gair Co. Canada Ltd., Toronto, was elected a director of Robert Gair Co., Inc. He takes the place of GEORGE M. WILLOUGHBY who resigned as a director of Robert Gair Co., Inc.

JOHN W. JORDAN, secretary, has been promoted to vice-president and general counsel of the Brown Co. Mr. Jordan has served as secretary since 1943.

HAROLD L. MITCHELL, now director of Central States Forest Experiment Station at Columbus, Ohio, has been appointed director of the Southern Forest Experiment Station at New Orleans. He will be succeeded at Columbus by Philip A. Briegleb, who has been chief of the Division of Forest Management Research at the Pacific Northwest Forest Experiment Station, Portland, Ore.

HARRY A. KIESELBACH, general manager of the Insulation Department for Johns-Manville Sales Corp. until his recent retirement, has been retained as technical consultant to The Magnesia Insulation Manufacturers Assn.

LEON J. KOERNER, of Vancouver, has been named president of Alaska Pine & Cellulose Ltd., which was recently organized by merger of B. C. Pulp & Paper Co., Ltd., and Alaska Pine. Alaska Pine & Cellulose Ltd. is owned jointly by Abitibi Power & Paper Co., Ltd., and the Koerner interests.

ASSOCIATIONS

CPPA WESTERN BRANCH ELECTION

Following the resignation of R. Logan Mayhew, formerly vice-president, Sidney Roofing & Paper Co. Ltd., who has now withdrawn from the pulp and paper industry and who was chairman of the Western Branch, Canadian Pulp and Paper Assn., a special meeting of the Western Branch was called to elect new officers and members of the executive committee.

Paul E. Cooper, president, Pacific Mills Ltd., was elected chairman of the Western Branch. The following senior officers of the pulp and paper companies in British Columbia were elected to the executive committee.

Alaska Pine & Cellulose Ltd., W. Koerner, vice-president, Leslie Cleminson, general manager; Bloedel, Stewart & Welch Ltd., Pulp Division, Prentice Bloedel, president, S. G. Smith, general manager; Canadian Forest Products Ltd., Pacific Veneer & Plywood Division, J. G. Prentice, president; Columbia Cellulose Company Ltd., D. G. Stenstrom, Western representative, W. C. R. Jones, mill manager; H. R. MacMillan Export Company Ltd., Pulp Division, B. M. Hoffmeister, president, W. J. Van Dusen, vice-chairman; Howe Sound Pulp Company Ltd., L. L. G. Bentley, president; Pacific Mills Ltd., Paul E. Cooper, president, J. A. Young, vice-president; Powell River Company Ltd., H. S. Foley, president, M. J. Foley, executive vice-president; Sidney Roofing & Paper Co. Ltd., J. A. Craig, general manager; Westminster Paper Company Ltd., E. M. Herb, president, F. F. Foote, secretary-treasurer; Leander Manley, secretary manager.

WASTE MATERIAL DEALERS MOVE

After almost 32 years in the same Times Tower offices in New York City, the National Assn. of Waste Material Dealers, Inc., headquarters moved early in June.

The new site is at 271 Madison Avenue, between 39th and 40th Streets. The new telephone number will be MUrray Hill 4-4147.

EMPIRE STATE PROGRAM

With more than half of the hotel rooms reserved, Empire State TAPPI, announces its program for the White Face Inn Meeting June 27-30.

Social Events

June 27—Get-together party starting 6:30 P. M.

June 28—Men—Morning—Technical Meeting. Afternoon — Trapshooting. Lunch—Buffet 12:00 Noon.

Women—Morning—Ladies Putting Tournament. Afternoon—Golf Tournament. Boat Trip on Lake.

Evening—Dinner 7:30 P. M. Speaker and late dancing. Dress optional.

June 29—Men—Morning—Technical Meeting. Afternoon—Golf Tournament—get off early. Lunch—Buffet, Noon.

Women—Morning—Trip to Whiteface Mountain & The North Pole (It's fantastic). Afternoon—Bridge & Canasta Contest. Evening—Dinner 7:30 P. M. Prizes—Dance (Costumes) (Old clothes, College, shipwreck, Hobo, etc.)

June 30—Morning—Technical Meeting. Noon—Buffet Lunch.

Tentative Technical Program

June 28—9:30 A. M.—Technical Program—(Chairman to be selected)

(1) "Industry's Role as Related to New York State's Pulpwood Supply"—Mr. G. A. Pesez, Assistant Resident Manager of Woodlands, International Paper Co., Glens Falls, N. Y.

(2) "Public and Private Forestry Get Together"—Mr. J. Victor Skiff, Deputy Commissioner, State of New York Conservation Department, Albany, New York.

(3) "Utilization of Hardwoods for Chemical Pulp"—Mr. F. W. O'Neill, Associate Professor of Pulp and Paper Manufacture, State University of New York, College of Forestry, Syracuse, N. Y.

June 29—9:30 A. M.—Technical Program—(Chairman to be selected)

(4) "Trends in the Paperboard Industry"—Mr. P. S. Bolton, Research and Technical Director, Robert Gair Co., Inc. Uncasville, Conn. (Will include a discussion of waste paper supply and utilization.)

(5) A Paper on the burning of sulphite waste liquor by Mr. W. J. Darmstadt and Mr. F. H. Richter of the Babcock & Wilcox Co.

(6) "Impact of Defense Requirements on the Pulp and Paper Industry"—Mr. Clinton K. Royce, Head, Packaging Section, Office of Naval Material, Navy Department, Washington 25, D. C.

June 30—9:30 A. M.—Technical Program—(Chairman to be selected)

(7) "A Few Thoughts on Stream Pollution"—Mr. Horace A. Spencer, Director of Research, Knowlton Brothers, Watertown, N. Y.

(8) "Printing Ink and Equipment Developments and Their Effect on Paper Requirements"—Mr. Lou Engelhart, Products Development Laboratory, International Printing Ink Div. of Interchemical Corp., Elizabeth, N. J.

(9) "Reciprocal Paper — Plastics Developments"—Dr. E. C. John, Director of Research and Prof. of Forest Chemistry, State University of New York, College of Forestry, Syracuse, N. Y.

HUDSON VALLEY TAPPI MEETS

GLENS FALLS, N. Y.—The final meeting of the Hudson Valley Dist., Empire State Section of TAPPI, was held at Milfranks Restaurant on May 17. The meeting closed a state-wide program on the "Political and Economic Problems of the Paper Industry." The program has been developed along the lines of a Kefauver committee meeting. H. M. Rice, Chairman of Thousand Islands Park Commission, acting as prosecutor, and H. J. Perry, editor of *Paper Trade Journal*, as writers, with the audience free to join in at anytime. A lively discussion arose on the subjects of Adirondack Salvage, Water Policy, Pulp Shortage and Southern Expansion.

NAWMD EXEC. COMMITTEE

Appointments to the Waste Paper Institute Executive Committee of the National Assn. of Waste Material Dealers, Inc., follow: James Derrico, The Derrico Co., Inc., New York City; David M. Dickson, Penn Paper & Stock Co., Philadelphia, Pa.; Anthony S. Gaccione, Toga Paper Stock Co., Inc., New York City; Samuel I. Hershman, I. Hershman & Co., Inc., New Haven, Conn.; Pincus Koplin, Georgia Paper Stock Co., Inc., Atlanta, Ga.; A. Lyons Newman, Central Paper Mill Supply Co., Syracuse, N. Y.; Harry Pearson, Pioneer Paper Stock Co., Kalamazoo, Mich.; and John S. Letellier, Letellier-Phillips Paper Co., Inc., New Orleans, La.

Paul Jos. White, Great Eastern Packing & Paper Stock Corp., New York City, N. Y., is eastern chairman, and Harold Shilling, The U. S. Paper Supply Co., Chicago, Ill., is western chairman.

RAG COUNCIL EXEC. COMMITTEE

Anthony Nicoletti, D. Benedetto, Inc., New York City, president of the National Assn. of Waste Material Dealers, Inc., Cotton Rag Council, has named the group's executive committee, as well as sub-committee, chairmen.

Those named follow: James Derrico, The Derrico Co., New York City; A. L. Feierman, A. L. Feierman, Philadelphia, Pa.; Harris Goldman, Harris Goldman Co., Inc., New York City; David Golub, Charles Harley Co., San Francisco, Calif.; Julius Levine, Atlantic By-Products Co., New York City; Joseph F. Maggese, Rag Processing Co., Inc., Long Island City, N. Y.; Bert Maxman, S. Maxman, Philadelphia, Pa.; Carlton B. Overton, Castle & Overton, Inc., New York City; Boris Petricoff, The Leshner Corp., Hamilton, O.; Arthur Rosenfeld, William Steck & Co., New York City; Joseph Schapiro, S. Schapiro & Sons, Inc., Baltimore, Md.; L. H. Silverstein, Cohen & Silverstein, Baltimore, Md.; and Jacob Solotken, J. Solotken & Co., Inc., Indianapolis, Ind.

Sub-committeemen are as follows: New cuttings, Mr. Maxman; mixed rags, Messrs. Maggese and Solotken, co-chairmen; repackers, Mr. Derrico; brokers, Mr. Feierman; rope, strings and bagging, Mr. Rosenfeld; cotton rag importers, Mr. Overton; and liaison with Waste Paper Institute, Messrs. Goldman, Overton and Paul Jos. White.

GOVERNMENT GOSPEL

Newsprint To France

WASHINGTON, D. C.—An emergency allocation of 3,000 tons of newsprint to France has been decided by the Pulp-Paper Committee of the International Materials Conference.

The committee closed its receipt of reports of urgent requirements by nonmember countries having no domestic production. They will be first considered by a subcommittee made up of representatives of Canada, Sweden and the United States.

Questionnaires to all countries, concerning past and present consumption and production, along with future requirements, will be received up to June 22.

Alkali and Chlorine Production

WASHINGTON, D. C.—NPA has cast doubt on the likelihood that alkali and chlorine producers would receive certificates of necessity for expansion, in all cases.

Meeting with industry members, NPA officials said a survey of U. S. alkali production, made to learn if expansion is needed, indicated that capacity is now roughly 4,500,000 tons a year of soda ash, 2,500,000 tons of caustic soda are being produced against 2,250,000 tons used, while projecting soda ash needs as far as 1953, only 3,500,000 tons will be needed in that future period.

However, industry members recommended that NPA conduct a geographical survey of production facilities.

Shipping Sack Demand

WASHINGTON, D. C.—With military requirements for paper shipping sacks now at a peak, fourth quarter, 1951 demand may decline barring new world crises, NPA indicated to manufacturers this week.

An organization meeting for the Paper Shipping Sack industry considered materials problems affecting their output, but it was said that while paper is in short supply, manufacturers generally are meeting demand for sacks. The existing industrial capacity can meet current needs, NPA was advised.

Differing from the trend of military demand, it was stated that chemicals producers' requirements for paper shipping sacks will rise sharply in the third quarter. Fourth quarter demand from the agriculture and food industries will gain substantially; bag requirements for metals and minerals will rise also, as will requirements from the building industry.

Resigns from W.S.B.

Reuben Robertson, Jr., president of Champion Paper & Fiber Co., has resigned from the Wage Stabilization Board.

Amend Regulation 4

The NPA adjusted limitations on the use of a defense order rating (DO-97) for maintenance, repair and operating supply items to compensate for increased prices and accelerated programs.

This action, an amendment to NPA Regulation 4, permits use of the DO-97 rating for up to 120 percent of the amount spent on such MRO items during the base period. The limit had been 100 percent.

NPA explained that this situation developed:

1. Prices on MRO items increased about 10 percent over the base period average. Thus organizations weren't getting as much materials as they were during the base period, since limitation is on a dollar expenditure basis.

2. Expansions and increased use of available facilities created a demand for more MRO items at the very time organizations were getting less because of the price factor. This increased demand was estimated at 10 percent.

Therefore, the limitation on DO-97 use was increased from 100 percent to 120 percent to absorb the increase price and use factors.

In addition to the use increase, the amendment also made these changes in Regulation 4 to provide flexibility and to reduce the flow of applications for quota adjustments:

1. Any organization that uses the DO-97 rating to get 20 percent or less of its quarterly quota will also be permitted to purchase an unlimited MRO total without use of the rating, subject to inventory and use limitations and any restrictions contained in other NPA orders. Heretofore, if a firm used the DO-97 rating at all, it was limited to an overall total of 100 percent, rated or unrated, of its base period use.

An organization now will be able to use DO-97 for some scarce items and still be free to make increased purchases of other needs on the open market. This should tend to prevent unnecessary DO-97 use, NPA said, as well as conserving its use for the more scarce materials.

2. The amended order permits a choice of base period: Either the calendar year or the nearest fiscal year ending before March 1, 1951.

3. DO-97 use for capital additions is limited to 10 percent of the quarterly quota or to $750, whichever is higher. This is to prevent overuse for capital additions at the expense of MRO use, NPA said.

4. Companies which have more than one plant within the United States and its territories and possessions now have the option of deciding whether MRO quotas shall be established for each plant individually or for the organization as a whole. Previously, quotas were on a single-plant basis.

5. DO-97 cannot be used to obtain material on lease.

The defense rated order for maintenance, repair and operating supplies may be used by all business firms, government agencies and public and private institutions such as schools, libraries, hospitals, churches, clubs and welfare establishments. It may not be used for procurement of personal or household supplies.

Ask Increased Financing

ECA has received a request from Austria for $43,000 additional financing for purchase of construction, mining and conveying equipment in the United States under the ECA Purchase Authorization 31-P28-00-6558. This equipment is to be used in connection with the erection of a kraft paper mill at Nettingsdorf, (ECA Project No. 28). The Austrian firm is Nettingsdorfer Papierfabrik Aktiengesellschaft, located at Nettingsdorf, Upper Austria. If the increase in the amount of the purchase authorization is approved by ECA the purchases will be made by the parent company.

No Shipping Container Controls

WASHINGTON, D. C.—No immediate need is seen for controls on production of fiber shipping containers, the government has been informed by an advisory group representing the Corrugated and Solid Fiber Shipping Container Industry.

Cutbacks in consumer goods have reduced demand, it was pointed out, and fiber container manufacturers are using the slack period to rebuild seriously-depleted inventories, to be ready for an expected heavy demand next Fall. Production in most areas, they reported, is on a normal one-shift basis.

NPA advised that paperboard production is up 20 percent from the 1950 rate, and an estimated 12,700,000 tons of paperboard will be produced this year. Output of container board this year is expected to go to 6,800,000 tons, about 1,200,000 over the 1950 level. NPA added that adhesives and tops are in good supply, but supplies of stitching wire are tight.

Emergency use of paperboard grades which would not meet ordinary standard tests, said the advisory group, has enabled the industry to meet orders for fiber containers.

Container Price Regulations

WASHINGTON, D. C. — Dollars and cents ceilings for liquid-tight paper containers would be practical, industry members have advised OPS at an initial conference over price problems.

Members of the paperboard milk bottles industry, also holding a first meeting with OPS representatives, have agreed to furnish cost information on key items made in their industry, as a preliminary to writing a tailored price regulation.

ALL-OUT PRODUCTION

demands

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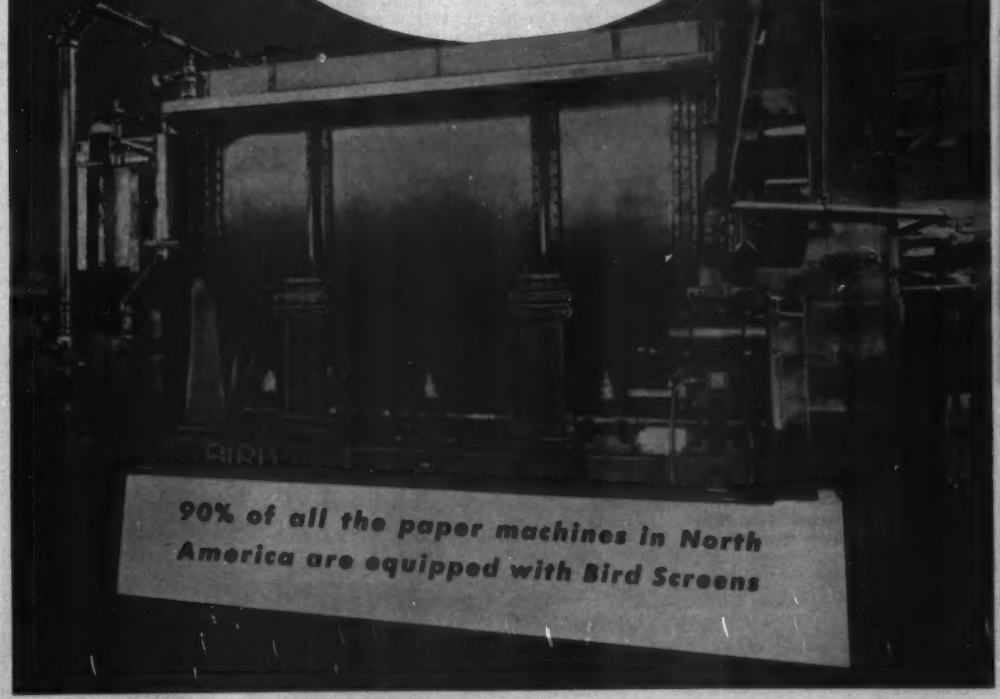

90% of all the paper machines in North America are equipped with Bird Screens

I.M.C. Sulphur Report

The Sulphur Committee of the International Materials Conference announces that it has sent to member and non-member governments its First Report, as well as questionnaires which call for statistical data and information relating to sulphur and sulphur-bearing materials Report No. 1 is a report of and recommendations on the production, conservation and control of sulphur.

The Report states that, for the free world, requirements of native sulphur in 1951 are expected to exceed supply by at least one million tons. This shortage, which may be intensified as the demand for sulphur increases, makes it essential that not only should production of native sulphur be maintained, and if possible increased, but that the maximum effort should be made to produce and use other sulphur-bearing materials, to conserve sulphur and substitute other materials for it, and to control domestic distribution and use.

Unless remedial steps are taken immediately and prosecuted with the greatest possible vigor the deficiency between supply and demand will continue to increase.

Of the several ways available for supplementing supplies of native sulphur the most promising appear to be:

1. Increased production of pyrites and increased use thereof in the manufacture of sulphuric acid;

2. Increased use of waste smelter (roaster) and industrial gases;

3. Expansion of the use of raw materials such as anhydrite and gypsum in the manufacture of sulphuric acid and ammonium sulphate.

The installation and modification of plants and the putting into operation of plans to mine, recover, and transport pyrites and other raw materials will take time. Meanwhile, it is essential that sulphur should be conserved as much as possible and that it should be used only for essential purposes or where it cannot be replaced by other materials.

The measures outlined above will not provide a remedy for the immediate shortage and the Committee is considering methods of effective distribution of available supplies of sulphur.

The Committee recommends that:

1. Every country should make a critical examination of its resources of sulphur and sulphur-bearing materials and develop them to the maximum extent practicable, especially for the production of sulphuric acid;

2. Those countries which have no resources of sulphur and sulphur-bearing materials or whose resources are small should examine the possibility of obtaining raw materials other than sulphur from elsewhere and of using them as far as practicable, especially in the manufacture of sulphuric acid;

3. Conservation in the use of sulphur should be practiced wherever possible;

4. Where it has not been done already control of the use of sulphur should be instituted so that it will not be used wastefully or for non-essential purposes;

5. Since in certain countries, the earliest possible completion of projects for the production of pyrites and for the use of pyrites as a source of sulphur is desirable, countries supplying plant and equipment for such purposes should facilitate its manufacture and delivery;

6. To assist the Committee in the continuation of its work, each country should furnish to the Committee not later than October 31, 1951, a report indicating the progress made in implementing any or all of the recommendations in 1, 2, 3, and 4.

Copper and Copper Base Alloys

NPA has notified producers of copper and copper base alloy products that limitations on acceptance of defense rated (DO) orders for July shipment will be increased substantially.

Order M-11 will be amended, the producers were told, to make the first quarter of 1951 the base period for brass mill and wire mill products.

Brass mills were advised that limitations on acceptance of rated orders will be set according to the following percentages of monthly average shipments of the same products in the first three months of 1951:

Alloy Products	*Percent*
Rod, bar, wire	80
Fourdrinier wire	115
Seamless tube	50

Rosin Production

WASHINGTON, D. C. — Wood rosin production for the 1950-1951 season established a new industry record with 1,339,410 drums for the period, the Bureau of Agricultural Economics reported last week.

In its annual naval stores report, the Bureau added that output of both wood and gum rosin totaled 2,137,030 drums, compared with the combined production for the preceding year of 2,033,510 drums.

Wood rosin stocks at the end of March, 1951, were reported as 100,040 drums, an increase of 8,380 drums from the end of the previous season. Combined stocks of wood and gum rosin on March 31 were reported at 558,580 drums, a decline of 335,700 drums from the end of the previous year.

M-67 Aluminum Foil

Aluminum Foil for containers and packaging materials was taken from M-7 and placed under a special order M-67. The new limitations are medical supplies, hydroscopic drugs 100 percent—antibiotics unrestricted—food for human consumption including uncooked bakery goods and others defined in memorandum 16FR3410 NPA–PMA, USDA 90 percent — bakery goods, chewing gum, tobacco, candy, ice cream 65 percent—all other uses in containers or packaging 65 percent.

Certificates of Necessity by Industrial Classification Through May 7, 1951

	APPLICATIONS FILED		APPLICATIONS APPROVED			
	Number	Amount (Millions of Dollars)	Number	Amount Requested	Amount Eligible	Percentage Certified
BASIC MATERIALS—Production and Fabrication	2,965	$9,811.5	576	$4,045.3	$2,842.8	70.3
01. Coal and coke	114	208.5	15	85.2	72.1	84.6
02. Iron ore-mining	92	267.9	12	68.3	49.4	81.9
03. Non-ferrous ores-mining	97	565.5	13	213.6	142.1	66.5
04. Iron and steel-production and fabrication	688	3,718.9	154	1,985.2	1,429.0	72.0
05. Non-ferrous metals and alloys—production and fabrication	235	632.5	38	322.3	262.6	81.5
06. Metal scrap reclaiming	183	20.1	48	6.6	5.0	75.8
07. Chemical products (except synthetic rubber)	591	1,681.2	82	447.4	233.0	52.1
08. Gasoline, fuel oils and lubricants	259	1,133.8	65	421.3	334.7	79.4
09. Rubber	19	22.8	1	1.6	1.1	68.8
10. Refractories	115	87.6	68	60.3	50.9	84.4
11. Fiber glass	20	32.1	4	15.0	10.9	72.7
12. Cement and concrete products	46	127.2	4	26.2	15.0	74.3
13. Cotton ginning	61	10.8	14	2.1	1.4	66.7
14. Textiles	194	491.0	33	50.3	25.5	50.7
15. Lumber and basic products	110	65.4	3	1.8	1.1	61.1
16. Pulp and paper	141	746.2	32	352.1	209.0	59.4

"Tycol Acylkup boosts bearing life... smooths the way for heavier loads"

Of course! Tycol Acylkup Bearing Grease "stays put" . . . keeps anti-friction bearings running smooth and cool. Finest quality neutral oils give it high load-carrying capacities. Tycol Acylkup is firmly resistant to the washing action of water. Its dependable lubricating abilities lengthen bearing life and reduce maintenance costs. Call your nearest Tide Water Associated office for further information.

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Four Million GPD from Single Caisson Well

Nial Sherwood[1]

Figure 1—This will show the magnitude of the outside well diameter. The large size is an important factor for yielding reliable, trouble-free water.

The Village of Warwick, N. Y., located close to the northern boundary line of New Jersey, has a population of about 2700.

In the past, Warwick was supplied with water from two surface reservoirs, but due to insufficient storage, water capacity was small and its quality unsatisfactory, especially during rainy and dry periods when a considerable amount of suspended solids was carried in the water.

To remedy the situation, a conventional-type gravel-packed well was installed in 1938. The capacity of this well was approximately 200 gallons per minute, and a short period after installation, it started "pulling in" silt and fine sand. This undesirable situation became progressively worse and radical remedial measures had to be resorted to.

Situation Called for Expert Ground Water Study

With constantly increasing consumer demand and progressive deterioration in the reservoir and well conditions, a new, but economical, source of supply was sought. Because of the peculiar ground water conditions in the area, presenting a silt problem, a more appropriate type of well had to be employed, and as such, the Caisson Well was selected. But the main problem was the location of a new and more promising well field, which was a difficult engineering problem, in itself.

The services of Caisson Wells, Inc., Ground Water Engineers and Contractors, were secured after a thorough study of their Caisson Well. This organization performed careful underground explorations in the vicinity of the existing well, and reported the discovery of an exceptionally good ground water field where they recommended the installation of one Caisson Well. Six-inch test drilling was used throughout the exploratory work, which revealed that a single Caisson Well, 100-inch outside diameter, could yield well in excess of the 720,000 gallons per day (500 GPM) required by the Village.

[1] Consulting Engineer, Liberty, N. Y.

Selection of Well Type

The selection of a Caisson Well for Warwick was made after a thorough study of its merits, which are outlined below:

1. As is well known, a large diameter well yields, generally, large capacities of trouble-free water. The well bottom and screen can be inspected by overpumping and actually going down. Any possible silt accumulation can be readily removed by a separate sump pump, without interrupting operation.

2. The well shaft is of reinforced concrete, and the screen of special metal. Since the structure is thus, substantially immune to corrosion or other injurious attacks, its life span is considerably greater than that of conventional-type wells.

3. The well screen extends circumferentially on the outside well-diameter and only a small screen-height is usually required to secure an ample open area. This means greater available drawdown and hence greater capacity.

4. Water enters the well, both laterally through the screen, and upward through the open bottom. Because of this, entrance water velocities are extremely low and danger of clogging, incrustation or sanding is greatly minimized.

5. A single Caisson Well can accom-

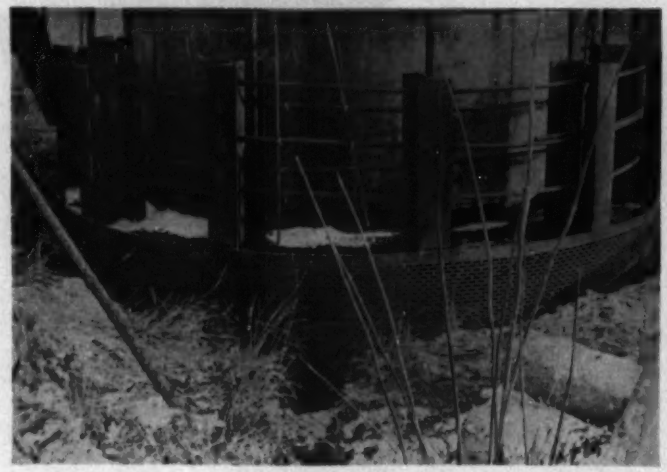

Figure 2—Everdure Screen at well bottom, flush with outside caisson surface. Note vertical beams to be encased in concrete

modate two or more pumps, one of which can be a stand-by.

General Conditions at the Selected Site

The approximate log of the formation at the well site was as follows:

0-12′: Sandy loam with streaks of sand, about 1 foot of topsoil.

12′-26′: Grey clay with sand, gravel and boulders (hardpan).

26′-44′: Sand, gravel, boulders and some clay.

44′-48′ (approximately): Grey clay with sand, gravel and boulders (hardpan).

48′-57′: Sand, gravel and boulders.

This log indicates that the underground formation was divided into two horizons, wherein water conditions were artesian. Both of these horizons were tapped by the Caisson Well and the greatest, by far, yield came from the bottom horizon. Static water level in the well was 5 to 6 feet higher than the general ground water table.

The selected well site was approximately 500 feet east of the existing Warwick well and within the western extremity of an oblong valley filled with glacial deposits.

Well Construction

A Caisson Well is a reinforced-concrete vertical hollow shaft with open bottom, which is provided with a circumferential special-metal screen at the bottom. This shaft is built sectionally on the ground surface and caused to sink through excavation from within.

A novel patented method of caisson construction is employed by Caisson Wells, Inc., which permits speedy sinking and a substantial saving in cost. The resulting structure is completely monolithic and very strong, and can withstand the stresses developed during sinking very effectively.

First, the hollow-shaft structure is formed by two sets of precast reinforced-concrete cylinders, one set within the other. All cylinders have a uniform height of 4 feet. The outer cylinder has an outside diameter of 100 inches and the inner cylinder an outside diameter of about 7 feet, and they are so positioned in relation to themselves that construction joints along the shaft are staggered.

The annular space between the outer and inner cylinders is filled with grout while heavy vertical reinforcing bars are inserted in it and extended from the very bottom of the shaft to the top. The cylinders are placed in position by crane, and right after grouting, sinking is resumed. Installation of two cylinders, including placing of vertical steel and grouting requires about two hours.

The screen itself consists of an Everdur plate ¼ inch thick having ¼-by-1-inch oblong perforations and an open area of about 37 percent. It extends circumferentially all around, flush with the outside face of the shaft, and it is heavily reinforced from the inside with circumferential steel members and 12 columns of structural I-beams which are projected vertically through the first section of the shaft, poured in place right on top of the screen. Screen height is about 2 feet.

To start, a pit about 9 feet in diameter and 3 feet deep is excavated and the screen section is placed in it as a unit. The steel reinforcement is then wired in position and forms are placed from the inside and outside, to

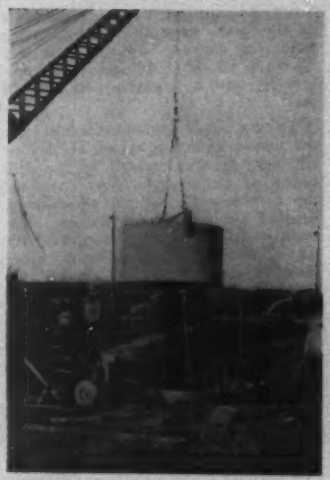

Figure 3—Assembling concrete cylinders with joints along caisson well body staggered.

form a cast-in-place cylinder on top of the screen. Concrete is then poured to a height of 4 feet above screen top with a wall thickness of 14 inches and after the forms are removed, sinking of the structure is started. As soon as the cast-in-place section is underground, a 4-foot-high outer cylinder and a 2-foot-high inner cylinder, are grouted in position, and sinking is resumed. After a 4-foot sinking, two more cylinders are grouted in position and the process is repeated until proper depth is reached.

All remaining cylinders are 4 feet high, except for the last outer cylinder which is 2 feet high, to make the well 14 inches thick all the way to the top.

Sinking Conditions

This well was sunk down to approximately 45 fet below ground. Due to the presence of large boulders, cemented together with clay, silt and sand, sinking conditions were extremely difficult and slow.

In spite of the fact that the Caisson's own weight was great and an extra heavy clamshell bucket was employed, the only way to loosen the bottom formation and permit its removal was by repeated blasting. There were days when sinking progress was not over 2 to 3 inches daily, but finally, after considerable effort and blasting, the shaft was sunk to proper depth and the well made to tap the lower-horizon water, which, as mentioned before, was by far the largest in capacity.

Well Development

After completion of sinking operations, the well was thoroughly developed by heavy pumpage and by compressed air surging.

A 1,000 gpm., electrically driven, caisson pump was used, and as the fine material deposited at the bottom was

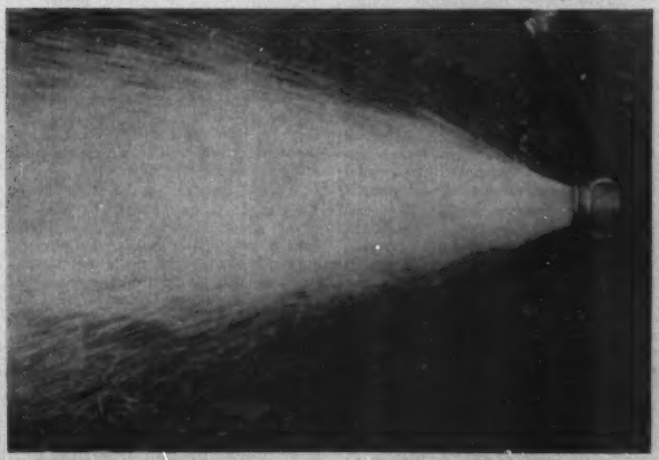

Figure 4—420 gpm. Test Capacity with stabilized drawdown of only 6 feet.

removed by an airlift pump, drawdown in the well kept decreasing, until, finally, a capacity of approximately 1,000 gpm., could be obtained comfortably with a drawdown of only 14 feet.

To remove all suspended solids from the water, including traces of clay or silt, surging was created by the provision of an air-tight steel cover on top of the well, through which compressed air was forced therein. The pressure of the injected air caused the water in the Caisson to be displaced outward through the screen and the bottom, and upon the sudden release of air, the water returned to its original position quite rapidly, entraining with it all loose particles, such as, fine sand, silt or clay, which were deposited at the well bottom, and which were eventually removed by pumping.

These operations were continued until the water pumped out was perfectly clear (practically zero color) and until all traces of silt or clay were removed from the well bottom.

Acceptance Capacity Test

This test was to be conducted with the contractor's 1,000 gpm., electrically driven pump, which was operating 24 hours a day during development.

On the night of March 7, 1951, the pump was operating in the well, as usual, when a power failure occurred on the high-tension line in northern New York. The motor stopped operating and the water rose rapidly to static level and covered it completely, thus putting the pump out of commission.

The acceptance test date was set for March 9, 1951, and it was too late to secure another pump of such a large capacity. The Mayor, Mr. John Deming, Jr., put at the contractor's disposal one of Warwick's fire trucks for the capacity test.

This truck could not pump more than 430 gallons per minute, and at this capacity the water level reached stability in about 30 minutes with a drawdown of only 6 feet.

However, as mentioned before, the well was pumped, day and night, at a capacity of approximately 1,000 gpm., at a stabilized drawdown of about 14 feet. In an artesian well, obtaining most of its water from the bottom, water capacities are in direct proportion to drawdowns, or, putting it in another way, the ratio of capacity to drawdown, called the specific capacity of the well, is constant. Note that the specific capacity for both, 430 gpm., and 1,000 gpm., figures to be about 72 gpm., per foot of drawdown.

On the basis of the available drawdown of, conservatively, 44 feet, the potential Caisson Well capacity figures to be 3,170 gpm., which is equivalent to approximately 4,560,000 gallons per day.

Thus, it is safe to say that the Warwick Caisson Well is potentially capable of yielding 4,000,000 gallons per day.

The water quality, with the exception of some hardness, is excellent. The water is absolutely clear, tasteless and odorless, and is ready for domestic consumption. Warwick's silt problem has been definitely conquered.

Acknowledgments

The man who is to be credited for the solution of Warwick's water problem is the Water Commissioner, E. L. Hulse. Mayor John Deming, Jr., and the Village Council were instrumental in promoting the project. The writer and Alger Royce, of his office, were in charge of engineering and supervision. The underground explorations and detail designs were performed by Jordan S. Asketh, Chief Engineer of Caisson Well, Inc. Construction was under the direction of Ronald Foley, Construction Engineer, of the same company.

Manufacture of Consolidated Products From Wood Residues*

M. D. MACDONALD[1]

A variety of end products can be manufactured from wood residues if the recommendations in this report are followed. Flat board materials, molded shapes, die-pressed shapes, and laminated products (using resin-bound wood particles as a core) can be fabricated so as to encompass a wide range of density, strength, water resistance, shape, and appearance. Not all of the foregoing possibilities are described in detail, but sufficient information is provided to enable intelligent consideration of those factors that might be involved in the manufacture of any one of the items.

Wood as a Raw Material

Requirements for fabricating a board product by means of a dry process technique, using a thermosetting-resin binder, are such that the nature of the wood particles used is not critical. The product described in this report is a dry-process board and, in view of the foregoing, planing mills and wood fabricating plants may be regarded as satisfactory sources of wood raw material. Consideration must be given, however, to the fact that before a supply of suitable wood particles can be manufactured into uniform resin-bound board products, it must have, regardless of source, a constant moisture content and must be composed of particles that are consistent in range of size.

Moisture content should be controlled at about 4 percent. This can be accomplished through the use of standard drying equipment. Devices that are suitable for drying shavings and similar materials are available and are capable of drying their materials to any desired value from an initial moisture content that may be above the fiber-saturation point. It is not too difficult to dry materials of this type since the amount of surface area exposed to the controlled drying atmosphere is large in relation to the total volume of each piece. A higher or lower moisture content value might be as satisfactory as the prescribed optimum of 4 percent, provided it is held constant, and provided correction is made, during the operation of resin coating, for the amount of moisture in the wood particles. Factors which determine the amount of moisture that can be tolerated in a mat are associated largely with the operation of hot-pressing; these will be described more fully in subsequent discussion.

Wood particles, unlike wood fibers, have little if any ability to hold together mechanically when consolidated into a mat. As a result, the physical strength of a board made from wood particles is dependent on the quality of surface bond that exists between individual particles. An exception to this is the fact that a small amount of mechanical strength is imparted to boards made from fibrous particles, such as the long curled shavings produced by some types of stickers and planers.

Since strength is dependent on adhesion of particles, it is important to apply binder resins so that they provide

* Presented at the Fourth Annual National Meeting of the Forest Products Research Society.

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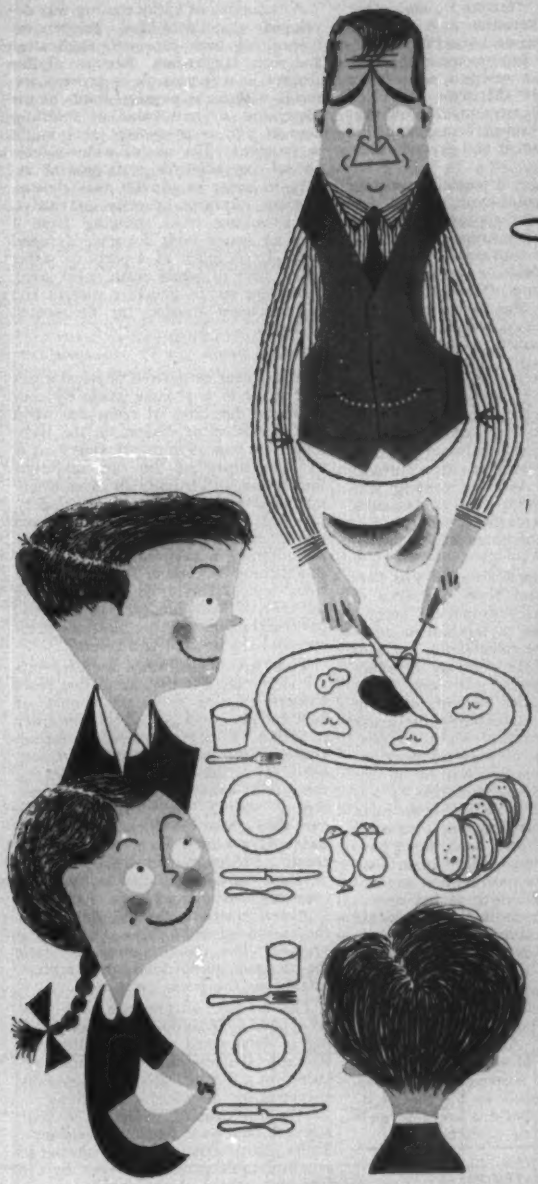

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maximum surface coverage. The ultimate objective should be to cover the entire surface area of each particle with an optimum amount of binder, so that satisfactory physical characteristics can be developed in the end product. Thin coatings of resin provide a bond that in most cases has less strength than wood material itself. Heavy coatings are wasteful because of the fact that the strength of a bond is not improved by the presence of thick films. Also, excessive resin binder will tend to be absorbed by the wood particles. This excessive resin does not contribute properties that are commensurate with the additional cost. The amount of binder required to provide an optimum coverage is influenced by the size of the particles. A given quantity, by weight, of large wood particles has considerably less aggregate surface area to be covered with resin than a comparable quantity of small particles.

Considerable leeway is possible in determining an optimum size range of particles. Materials like sawdust have the disadvantage of possessing large surface areas per unit volume, thus requiring excessive quantities of resin in order to establish desirable strength values. Very large particles introduce problems of resistance to densification under pressure. It is also difficult to coat their entire surface area with binder. Exploratory investigation has given indication that moderate particle sizes are most satisfactory. An exact range has not been established, but an acceptable classification should include material that will have a minimum mesh size of 0.05 inch and a maximum mesh size of 0.25 inch.

Resin Binders

Physical characteristics of resin-bound materials are derived from the quantity and quality of binder that is used in their manufacture. The quantity of resin binder used is expressed as a percentage of the total weight of the final product. In most cases, this value is determined on the basis of solids content of the resin under consideration.

A study of the effect of variation of resin content constituted one of the major experimental activities incident to this report. It was found that a board of acceptable quality could be made with a resin content of about 2.5 percent. Progressive depreciation of strength, water resistance, and other physical characteristics took place as resin content was decreased to 2.0 percent and lower. Improvement of physical qualities was realized when resin percentages were increased above 2.5 percent. Improvement tapered off rapidly as higher resin percentages, in the vicinity of 6 percent and greater, were used.

With the range in particle size used in this experimental work, a resin content of 2.5 percent appeared to give a complete surface coating of each individual particle with resin. Therefore, virtually no voids or areas without interfacial bonding of contacting particles existed in the finished product At binder values of less than 2.5 percent, voids did exist; strength was reduced and transfer of moisture was facilitated between particles. As resin percentages were increased above 2.5 percent, each particle received a thicker coating of binder, which resulted in improved adhesion between particles and was manifested in an improved board product. As resin content was further increased, the maximum strength of the resin itself was approached, with the result that improvement tapered off.

Satisfactory application of low percentages of liquid resin mixtures to dry wood particles cannot be accomplished by means of mechanical mixing. High resin concentration are usually produced at the point of introduction of the resin to the mix, while succeedingly smaller amounts of resin in the material surrounding the areas of high concentration serve to contribute to a lack of uniform distribution. The hygroscopic nature of dry wood aggravates this situation by absorbing moisture from the resin mixture, thereby retarding resin diffusion to all wood particles. Also, wood particles in the region of high resin concentration become thoroughly impregnated with resin, which is not necessary or desirable from the standpoint of obtaining maximum physical properties in the end product.

At the outset of this investigation, it became necessary to develop a means of coating particles in such a manner as to avoid the shortcomings of mechanical mixing. An apparatus based on the principle of spray coating particles as they are suspended in air was ultimately developed to fill the need. Details of this apparatus are described in the discussion of equipment.

RELATIONSHIP BETWEEN MOISTURE CONTENT, PRESSURE, AND SELF-SUSTAINING QUALITIES OF MATS FACED WITH RESIN-IMPREGNATED PAPER

Example No.	Moisture content[1] of unpressed mat	Self-sustaining quality at cold prepressing pressure[2] of					
	Percent	50 psi.	100 psi.	150 psi.	200 psi.	250 psi.	305 psi.
1	11	—	—	—	—	+	+
2	15	—	—	+	+	+	+
3	19	—	—	+	+	+	+
4	23	—	+	+	+	+	+
5	27	+	+	+	+	+	+

[1] On oven-dry basis.
[2] +, felt self-sustaining; —, felt not self sustaining.

A technique of spray coating was developed that permitted independent control of both moisture application and resin application. Because of this feature, it was possible to process material, within the physical limits of the apparatus, to any value of moisture content and resin content that might be specified. The use of water-soluble phenol formaldehyde resin was necessary in order to provide this control. Various mixtures of resin and water, on a volume basis, ranging from 1 part of water with 2 parts of liquid resin, to as much as 4 parts of water and 1 part of liquid resin, were used, depending on the moisture content and resin content desired for the coated particles.

Pressing

Attainment of desired physical characteristics in a product made by consolidating mixtures of resin and wood particles is as dependent on the technique and condition of pressing as it is on the nature of the raw materials themselves. In virtually all cases where synthetic resins are used as binders, pressing at elevated temperatures and pressures is mandatory. The technique of pressing, in most cases, amounts to establishing a proper correlation of time, temperature, and pressure with the type of resin binder, type of wood particle, amount of free moisture present, and the desired end result.

Time and temperature requirements are interrelated to the extent that resin binders require specific amounts of heat for given periods of time in order to attain a degree of condensation (cure) that results in a permanent bond. Heat has a catalytic effect on the rate of condensation of all thermosetting resins. Therefore, to realize cure throughout the thickness of a consolidated product, it is necessary to reach a predetermined degree of temperature throughout the layup. The recommended temperature for most synthetic resins is around 250° F. at the midthickness of the material being pressed. The time required to reach the desired midthickness temperature establishes the press cycle time.

The amount of pressure that must be applied to a layup during hot pressing is determined by the qualities of strength, density, and appearance required in a finished product. Generally speaking, low-pressure applications result in low density, moderate to poor strength, and poor moisture resistance. These characteristics may be altered to a considerable extent, however, by the type and amount of binder that is used. Application of high pressures results in improved physical qualities. A range of pressure up to 200 pounds per square inch may be considered low for the production of a hardboard material. Pressures ranging from 200 to 600 pounds per square inch are desirable for most particle board products. Die-pressed materials have been made from wood particles with pressure applications reaching 5,000 pounds per square inch.

Flat board products that were tested and evaluated comparatively during the conduct of this investigation were pressed at standard conditions of 300° F., and 300 pounds per square inch, for 10 minutes. Boards were cold flushed at the end of the press cycle as a means of avoiding surface blisters. Cold flushing amounted to running cold water through the steam platens until they had cooled to a point below 212° F.

The problem of cold matting resin-coated particles was investigated in considerable detail. Unlike wet-process fiber mats, dry-process wood material has little if any tendency to hold together prior to the application of external pressures. It was found that by adjusting the moisture content of particles comprising a mat to a value of between 10 and 35 percent of the weight of dry shavings, preferably between 18 and 27 percent, it is possible to prepress the mat cold, using relatively simple equipment, until it is consolidated sufficiently to be self-sustaining, that is it can be handled. A prepressed mat produced in this manner, through accurate control of moisture content values, may be handled by ordinary methods and equipment when cutting it into suitable lengths, transporting it from the felter to the hot press, and introducing it into the latter.

The effect of adjusting moisture content values of the mat on its ability to be cold pressed to a self-sustaining condition is illustrated by the data presented in *Table 1*. These data constitute the results of tests conducted by spray coating representative particles with 2.5 percent binder content, yet varying the total moisture content as indicated. The particles were formed into mats, which were faced with resin-impregnated (plastic) paper, then prepressed cold over the indicated range of pressures. Self-sustaining qualities of the prepressed mats were observed, the mats being described as self-sustaining if they held together sufficiently to permit cutting into unit lengths and introduction into a hot press.

Felting of resin-coated particles can be accomplished in a satisfactory manner if a continuous technique, as described under *Spray Coating Apparatus*, is used. Mechanical mixing methods, on the contrary, usually make felting difficult. Regardless of technique, effort should be exerted to produce a mat of uniform density and thickness. Failure to achieve this will result in serious consequences following final hot pressing. A product having nonuniform density, which in most cases results from poor felting, may have extreme variations in physical characteristics and, in all probability, it will warp considerably.

The density of a consolidated board is dependent on the amount of pressure applied. Other factors, such as density of the particular wood species used, temperature at time of pressing, and specific gravity of the resin binder, also have an effect on the final product.

Faces

Although unfaced consolidated board products are attractive and possess satisfactory physical qualities, the addition of faces to both surfaces generally results in an improved product. Excellent results have been obtained with resin-impregnated paper, kraft paper, sliced veneer, rotary-cut veneer, and cloth. It is probable that satisfactory results could be obtained with sheet plastics and thin metals, provided adequate surface-bonding adhesives are used. The fact that these materials can be applied as faces at the same time that the core material is being consolidated under heat and pressure is of particular advantage from the standpoint of facilitating production.

Data presented in this report are derived largely from board products that were faced with grade 3000 "Kimpreg" resin-impregnated paper. Faced boards were studied because they have more practical industrial applications than unfaced boards. Facings improved appearance, workability, and strength.

Sliced and rotary-cut veneers make extremely attractive faces for consolidated cores. It is possible to produce a minimum-cost product faced with mahogany, walnut, or other decorative veneers. These products, when made in the desired thickness, may be used wherever hardwood plywood or lumber core stock is currently being used. It is mandatory to use a balanced construction when veneers are used for facing. Although it is preferable to use a two-ply face, with the grain of adjacent veneers oriented at right angles, a single ply can be used.

Face materials must be coated with adhesive on the surface adjacent to the core. At low resin contents there is not a sufficient quantity of free binder in the core to provide adequate bonding of uncoated face material. Experimental results indicate that a sprayed coating of about 2.5 pounds of resin solids per 1000 square feet of veneer will provide adequate bonding between core and face when the core resin content ranges from 2.5 percent upwards. Adequate bonding of paper can be obtained with about the same resin application as that specified for veneer. Cloth, on the other hand, requires a considerably greater spread in order to provide sufficient resin to fill the interstices of the material. This requirement will vary with different types of cloth.

Steam accumulation between faces and core composites presents a problem during hot pressing. It has been found that resin-impregnated papers and similar impervious face materials are more susceptible to this condition than veneers, fabrics, and other materials that allow steam accumulations to dissipate by diffusion. To overcome the difficulties associated with this condition, heated platens should be cooled to a point well below 212° F. before hydraulic pressure is released from the assembly. Steam pockets are more likely when platen pressures are increased. Experimentation is the only way in which to determine the actual need of cold flushing. With certain face materials, the rate of escape of steam from the assembly may be sufficient to obviate its need.

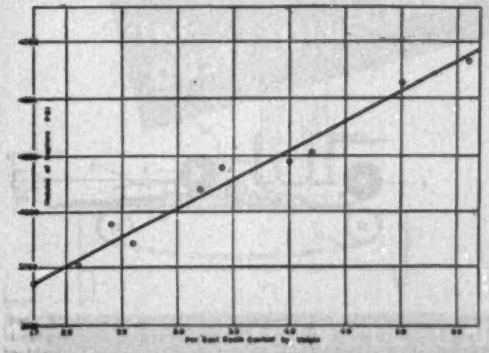

Figure 1—Modulus of rupture of spray-coated ½-inch wood residue board faced with a plastic paper and bonded with phenol formaldehyde resin.

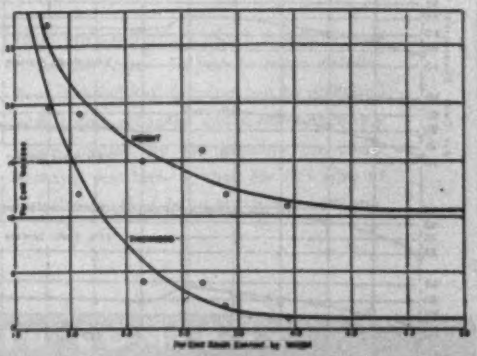

Figure 2—Water absorption after 24-hour soak of spray-coated wood residue board ¼ inch thick, faced with plastic paper and bonded with phenol formaldehyde resin.

Die-Shaped Products

With the use of properly constructed dies, resin-coated waste particles can be formed into shapes of simple or compound curvatures. Products, such as wheels for toy automobiles, blank shapes for toys, coasters for glasses, and knife handles, can be formed in plunger-type dies. Other products designed to conform to simple curvatures, such as packing carton separators, waterfall shapes for furniture, kitchen cabinet ends, molded baseboards for home construction, cove molding, and clock cases, can be readily made either with or without face materials.

To determine the feasibility of making such products, an experimental die was constructed to produce coasters for glasses. It was found that particles of the previously described standard mesh size, when coated with 5 percent binder and pressed at 5,000 pounds per square inch at 300° F., produced a product that had high strength and excellent water resistance. The wood particles used in this investigation were coated in such a manner as to add a minimum amount of moisture. This was done in order to avoid formation of high-pressure steam pockets that would doubtless be associated with the high pressures that were applied. It is not essential to use pressures as high as those used in this instance, but for small unit-sized items a high pressure may be desirable from the standpoint of appearance of the finished item. Some coasters were faced with printed rayon cloth, the results being quite satisfactory from the standpoint of appearance.

Plunger-type dies should be constructed with sufficient clearances to permit the escape of water vapor as it diffuses from the material being pressed. It may be desirable to provide a cold plunger die of rough dimensions for instantaneous application of pressure to form mats (or blanks) to be fed into a more accurately made heated die. In lieu of provision for cold matting, sufficient plunger travel should be allowed in the hot die to permit at least a 16-to-1 radio for compressing loose material into a consolidated state. This same compression ratio must be allowed for in a cold matting die. Variation of particle size can affect this ratio to a considerable extent.

Products molded to simple curvatures and faced with veneer or other face materials can be produced with relative ease and economy. Experimental molded units were made ¼ inch in thickness, with a 90° bend on a 2-inch radius. Various units were faced with Kimpreg grade 3000 resin-impregnated paper, sliced mahogany veneer, sliced walnut veneer, kraft paper, and left unfaced, all with fully satisfactory results.

Development of pressing technique enabled the use of fixed-center dies of standard design, a type generally used in the manufacture of molded plywood. Layups of desired size were prepressed in a manner identical with that recommended for the production of flat board products. Self-sustaining cold-pressed mats were then inserted between the opposed elements of the die. Spring brass cauls were used on both surfaces to provide retention, thereby avoiding possibility of mat disintegration during the period of die closure. If veneers or other rigid face materials are incorporated in a layup, the use of metal cauls is not necessary.

Physical Properties

Appearance

Unfaced products have a unique, attractive surface appearance that might be considered desirable for certain decorative or architectural application. The characteristics of the surface are affected by the amount of resin binder used and by conditions of pressing. Incorporation of high percentages of phenolic binder (roughly 5 per cent or greater) results in a decided darkening effect on the color of the wood particles; it also produces a surface glaze that may be desirable in some instances. The effect of pressure is manifested in compactness or hardness of the product. The size of wood particles used contributes to appearance. Small particles produce a homogeneous-appearing product, while large particles retain their individual identity, thereby producing an attractive design.

Modulus of Rupture

Figure 1 shows the range of modulus of rupture values for various percentages of binder content. The values were obtained by testing ¼-inch thick specimens in conformity with the procedure outlined in Federal Specification LLI-F-311, Fiberboard, Hard. Test specimens were cut from boards that were originally 12 inches square. Conditions of pressing were identical for all specimens: 300 pounds per square inch at 300° F. for 10 minutes, followed by cold flushing as explained in previous discussion.

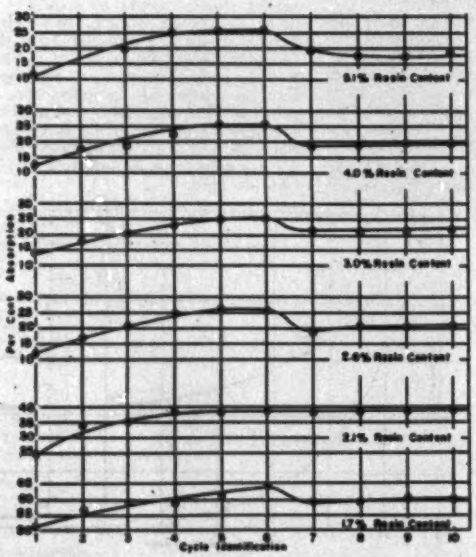

Figure 3—Water absorption of wood residue in 24-hour cyclic test (alternate wet and dry exposure).

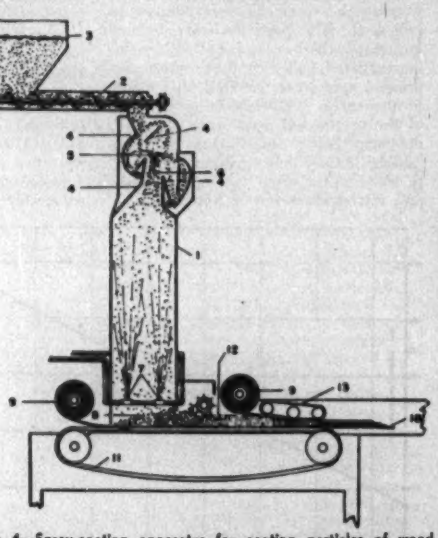

Figure 4—Spray-coating apparatus for coating particles of wood residue with bonding resin. 1, Coating Chamber; 2, worm feed; 3, hopper; 4, baffles; 5, area of particle impingement; 6, throat of coating chamber; 7, spray nozzles; 8, chamber pass-out; 9, mat-feed rolls; 10, matt assembly; 11, conveyor; 12, mat; 13, metal belt for prepressing.

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Modulus of rupture values drop sharply with resin binder contents lower than 2 percent. As resin content is increased above 2 percent, strength values tend to improve proportionately. At approximately 6 percent, improvement in strength tends to taper off. This is attributed to the fact that the maximum srength of the binder resin begins o affect the modulus of rupture near this point.

Values used to plot the curve in *Figure* 1 were obtained by testing boards faced two sides with Kimpreg grade 3000 resin-impregnated paper. It was determined that unfaced boards processed in an identical manner and of the same thickness had strength values approxiamtely 20 percent lower than those shown.

A correlation exists between strength and moisture content at time of pressing. From the standpoint of obtaining maximum strength, total moisture content should be held in the vicinity of 25 percent. As moisture content decreases, the modulus of rupture decreases; roughly, a 20 percent decrease in value of modulus of rupture can be expected when the moisture content is at or below 12 percent.

Since resin binders are costly, it is desirable to determine a point at which the economics of product manufacture can be balanced against use requirements. This investigation has led to the conclusion that a resin content in the range of 2.5 to 3.0 percent should be considered as an optimum. It is true that improved strength can be obtained with higher resin contents, but the improvement is in no way consistent with the increased costs of manufacture that would be incurred. Certain specialty items that bring a high market price may warrant the addition of more binder material.

Water Absorption: 24-Hour Immersion

Specimens obtained from boards of identical characteristics as those used in determining modulus of rupture values were exposed to a 24-hour immersion in water, at 72° F. Moisture absorption by specimens having various percentages of resin binder content is shown in *Figure 2*. Percentage increase in board thickness and percentage increase in board weight are illustrated. A resin-impregnated face material did not materially affect the rate of water absorption. Unfaced materials can be expected to react a little less favorably to the same exposure. It should be noted that at resin content values of less than 2 percent, the rate of absorption rises sharply. Little if any improvement in moisture resistance is provided by resin content values in excess of 3.5 percent.

Water Absorption: 10-Cycle, 24-Hour Exposure

Figure 3 shows the effect of alternate 24-hour immersion in water followed by drying in a 12 percent equilibrium atmosphere at room temperature for a total of 10 complete cycles. Specimens that were subjected to this test were taken from the same boards used to provide samples for the 24-hour immersion test.

Values shown indicate the percentages of moisture absorption at the end of each period of immersion in water. The effect of resin-binder content on the amount of water absorption is readily discernible from the graphs.

The decrease in moisture absorption percentage in evidence between the sixth and seventh cycles is attributed to the fact that a 48-hour drying period was inadvertently allowed in that one instance. For some reason, the excessive drying period resulted in a loss of moisture that was not picked up again during the remainder of the test run.

Visual inspection revealed that samples were in fair to excellent condition at the termination of testing. Samples with a resin-binder content of 2.1 percent or more showed little or no breakdown of structure. Those samples having 1.7 percent resin content swelled more on the edges than at the center regions of the pieces.

Equipment

The procedure of making a satisfactory product through the combination of synthetic resin binders with dry wood particles resolves into a problem of properly combining the two materials. As has been shown, the application of resin to wood particles must be accomplished in such a way that homogeneous coating of the surface of all particles is realized. At the same time, positive control of the amount of moisture that is added and the amount of resin that is applied must be maintained. Unfortunately, these requirements exceed the limitations of ordinary methods of mixing ingredients by mechanical means. It was found, however, that satisfactory coating could be achieved when separated wood particles were exposed to an atmosphere of sprayed resin binder.

Spray Coating Apparatus

Experimentation led to the construction of an apparatus that permits controlled coating of a continuous feed of wood particles. A schematic view of this apparatus is shown in *Figure 4*. It comprises a coating chamber (1) of suitable dimensions, which may be fabricated from either wood or metal. The upper end is provided with means for introducing a controlled and measured feed of the wood material to be coated with binder and then felted into a mat and consolidated. The introducing means is a variable-speed worm feed (2) that is supplied with material from a suitable hopper arrangement (3).

Planing-mill shavings or other refined wood residues introduced into the chamber by the worm feed tend to cling together and form aggregates or loose clusters that cannot be effectively coated with a liquid binder material; hence, means are provided for disintegrating these particle masses. The separated particles are entrained in a gaseous stream and subsequently coated with liquid binder. The disintegrating and entraining are accomplished by several jets that supply air at high velocity to the upper portion of the chamber. The streams of air from the jets are directed against the material as it feeds into the chamber, striking it with sufficient force to separate the component particles.

A series of baffles (4) is strategically positioned so that the entrained particles are divided into opposed streams that impinge on one another in region (5). The impinging action results in an area of high particle density and low velocity directly over the throat (6) of the coating chamber. At this point the particles fall at low velocity into the coating chamber, where they diffuse evenly over the cross-sectional area and are exposed to a controlled atmosphere of atomized resin.

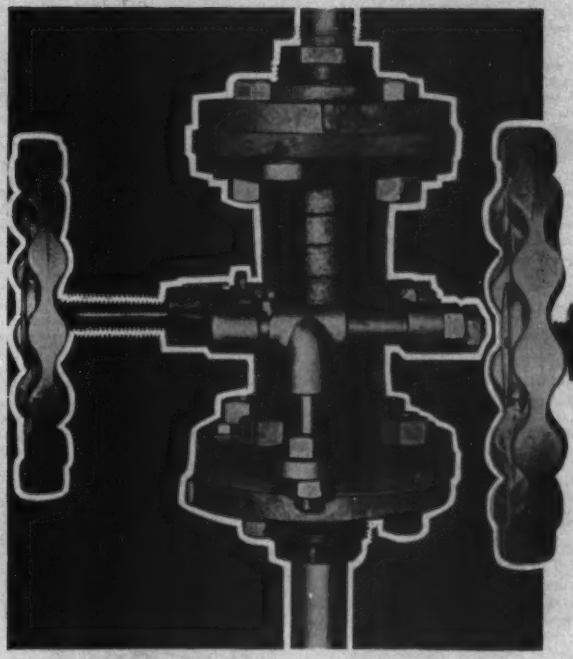
The resin mixture is introduced into the coating chamber in a direction counter-current to the stream of falling particles. Atomizing spray nozzles (7) placed near the bottom of the chamber discharge an appropriate combination of compressed air and pressurized resin-water mixture. Control of the amount of resin that is atomized is obtained by adjustment of air and mixture pressures. The ratio of resin to water in the atmosphere of atomized binder, the factor that determines final moisture content of the coated particles, is adjusted by diluting the neat resin.

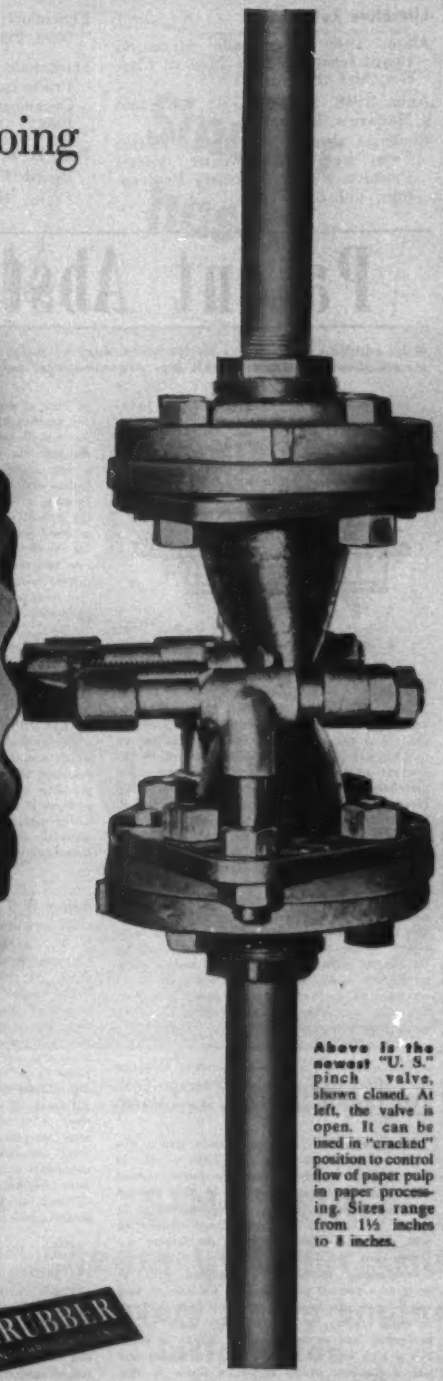
The rate of feed of wood particles through the apparatus, when coordinated with the amount of resin being atomized within the coating chamber, determines the final resin content of the coated material. Careful adjustment of these two variables is necessary to avoid either partial coating of particles or a condition of excessive coating accompanied by superfluous resin deposited on the chamber walls.

After being coated wtih binder, the particles pass out the bottom of the chamber (8) which is open to the atmosphere and positioned above an endless conveyor (11). Coated particles deposited on the conveyor are passed beneath a picker roll, thereby forming a mat of density and dimensions suitable for consolidation.

Face materials may be introduced under the discharge end of the coating chamber by means of the endless conveyor belt. Paper or cloth facing that has been coated with a suitable adhesive on the side that is to be in contact with the deposited mat may be fed from rolls (9) as indicated. Other means may be devised for feeding veneer and similar face materials that cannot be handled as conveniently as paper. After a mat (12) has been deposited on the bottom face, a top face may be applied to complete the assembly. Following the introduction of both faces, the assembly (10) can be prepressed in accordance with the recommendations of *Table 1*, by means of a traveling metal belt (13) or some other device.

What's U. S. Rubber doing with pinch valves?





United States Rubber is squeezing out new production economies with its latest pinch valve. Designed for pipe lines carrying abrasive or corrosive mixtures, the valve eliminates "water hammer", breaks up galvanic action in pipe lines.

The valve reduces replacement costs because it can be refitted to new valve bodies. No packing or repacking is needed. Its design is very compact, with mechanism, retaining rings and pinch valve body in a single unit—an advantage where space is limited. The valve is available in neoprene for oil-resistance, or butyl rubber for high heat and severe acid conditions, or pure gum stock for food and beverage conveyance. Write to address below.

Above is the newest "U. S." pinch valve, shown closed. At left, the valve is open. It can be used in "cracked" position to control flow of paper pulp in paper processing. Sizes range from 1½ inches to 8 inches.

PRODUCT OF U.S. RUBBER

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Literature References

Anon. 1948. Continuous Structural Board from Sawdust. Modern Plastics. Vol. 25, No. 1.

Anon. 1948. Sawdust Gold. Monsanto Magazine, December.

Burkhart, Richard L. 1948. Interior Trim from Wood Waste. Forest Products Research Society Proceedings, Vol. 2.

Elmendorf, Armin. 1948. Wood Fibers from Veneer Waste. Wood, June.

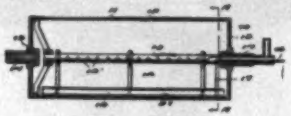
Macdonald, M. D. Die Molding Wood Products. *Pacific Plastics*, Part I, December 1947; Part II, January 1948.

Puff, H. B. and C. R. Simmons. 1949. Board Products Turn Waste Into Profit. *Wood*, August 1949.

Patent Abstracts

● In addition to abstracts on the technology of pulp, paper and related industries, miscellaneous abstracts which may provide useful information are included.

U.S. 2,545,917—Drainage Device for Drum Driers. James C. Cowie, Liverpool, Nova Scotia, Canada, assignor to Mersey Paper Company, Limited. Filed July 19, 1948 — Issued March 20, 1951.



In a drier, a hollow horizontal shaft, a rotating drum mounted to turn about said shaft, means to feed steam to the interior of said shaft, means for evacuating water therefrom comprising a stationary siphon extending radially of the interior of the drum, the radial extremity of the siphon being in close proximity to the inner periphery of the drum substantially at the bottom thereof, and means for removing water from the internal drum wall and directing it to the radial extremity of the siphon comprising a stationary blade past which the drum rotates extending longitudinally and carried by said shaft in close proximity to the surface of the inner wall of the drum substantially at the bottom thereof, the blade being disposed at a horizontal angle of about three degrees to the major axis of the drum, the portion of the blade remote from the siphon being displaced angularly in the direction opposite the direction of rotation of the drum with respect to the portion of the blade adjacent the siphon, the radial extremity of the siphon being on the side of the blade towards which the drum rotates, and the vertical plane perpendicular to the drum axis through the radial extremity of the siphon intersecting the blade.

U.S. 2,546,376—Pulp Beater. Walter N. Sherwood, Eagle Bridge, N. Y. Filed October 20, 1945 — Issued March 27, 1951.

In a pulp beater, the combination with a tub, of a bed plate extending from side to side of said tub and suspended above the bottom thereof to provide a passage for the flow of stock through said tub below said plate, a roll adapted to be rotated at comparatively high speed cooperating with said bed plate throughout a distance approximating its diameter; said bed plate being approximately symmetrically disposed with respect to a vertical plane through the axis of said roll, whereby stock will be projected from said roll at high velocity, at a substantial angle to the horizontal, and to a substantial height to maintain a high level of stock in said tub behind said roll; a platform fixedly suspended above the bottom of said tub and forming with the sides thereof a trough having its bottom extending from a zone closely adjacent both the end and top of said tub in front of said roll downwardly to said bed plate for the flow of stock therethrough to the descending side of said roll; a cover on said tub extending from the end thereof in front of said roll to a zone closely adjacent but above the level of the bottom of said trough at the entrance thereto and forming with the sides and end of said tub and the bottom of said trough a completely laterally enclosed passage of restricted cross-sectional area for the flow of stock therethrough under pressure into said trough; whereby a rolling and tumbling thereof will take place as it is discharged into said trough, and a thorough mixing thereof will be facilitated.

U.S. 2,546,705 — Method of Laminating Polyvinyl Alcohol Film To Paper and Product. Jay F. Strawinski, Philadelphia, Pa. Filed August 19, 1947. Issued March 27, 1951.

The method of making laminated sheet material which comprises increasing the area of a sheet of polyvinyl alcohol film by stretching the sheet in a plurality of directions, applying directly to the surfaces of the stretched sheet with aqueous moistening exterior webs of porous thin fibrous sheet material, and restraining the laminated material from shrinking during drying.

U.S. 2,547,208—Method for the Refining of Tall Oil Soap. Torsten Hasselstrom and Michael Stoll, New York, N. Y., assignors to U. S. Industrial Chemicals, Inc., Newark, N. J. Filed June 26, 1947 — Issued April 3, 1951.

The method of refining an aqueous solution of a tall oil soap comprising 25% to 70% water and also containing undesirable non-saponifiables and color bodies, which method comprises dissolving said aqueous solution to form a single phase in a dialkyl ketone which is liquid at ordinary temperatures and which, at ordinary temperatures, is soluble in water to the extent of about 0.2% to about 10% by weight and thereafter separating the ketone solution into a ketone layer containing the major portion of the non-saponifiables and color bodies and an aqueous layer containing the major portion of the tall oil soap by adding further water to the said ketone solution.

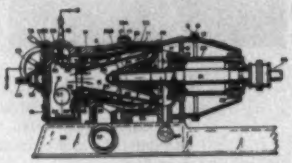
U. S. 2,547,395 — Container. George D. Jansen, Chicago, Ill., assignor to Jansen Container Co., Chicago, Ill. Filed December 31, 1948—Issued April 3, 1951.

A container comprising a tubular fiberboard side wall, a fiberboard bottom mounted within one end of said side wall, said bottom having an annular flange engaging the inner surface of said side wall and with its edge flush with the adjacent rim of the side wall, a metallic retaining ring formed to secure said annular bottom flange to said side wall, a metallic reinforcing ring disposed to enclose the rim at the other end of said side wall, said retaining and reinforcing rings each being formed from a strip of metal bent along its longitudinal axis to provide opposing inner and outer flanges substantially coextensive in width, the medial portions of said retaining and reinforcing ring flanges and the fiberboard therebetween being formed concavo-convex in cross-section to define outwardly facing annular grooves, the inner peripheral portions of said retaining and reinforcing ring flanges being parallel with the longitudinal axis of the container, the outer peripheral portions of said reinforcing ring flanges sloping inwardly to provide a frustro-conical surface to facilitate the mounting of a cover thereon, and a cover formed with an annular flange to receive and engage said reinforcing ring, said cover flange being formed on its inner surface with an annular ridge for snap engagement into the outwardly facing groove formed in the reinforcing ring.

U. S. 2,547,628 — Folding Carton. Ransom C. Ellsworth, Leroy, Ohio, assignor to The Ohio Boxboard Company, Rittman, Ohio. Filed June 2, 1947 — Issued April 3, 1951.

A folding carton, having a bottom member, side wall members and end wall members extending upwardly from the sides and ends of said bottom member, flaps extending from the lateral edges of said end wall members and lying along the side wall members adjacent to their ends, side wall flanges forming parts of said flaps and arranged to extend laterally inwardly of the carton in substantially normal offstanding relation to the side walls thereof adjacent to at least one of said end walls, and an end wall flange extending from said one end wall longitudinally inwardly of the carton in substantially normal offstanding relation to said end wall, the inwardly extending body of said flange being shorter than said end wall and being provided with means for interlocking engagement with the side wall flanges, said interlocking means including interlocking tabs providing notches spaced from the end edges of the flanges a distance substantially equal to the width of the side wall flanges.

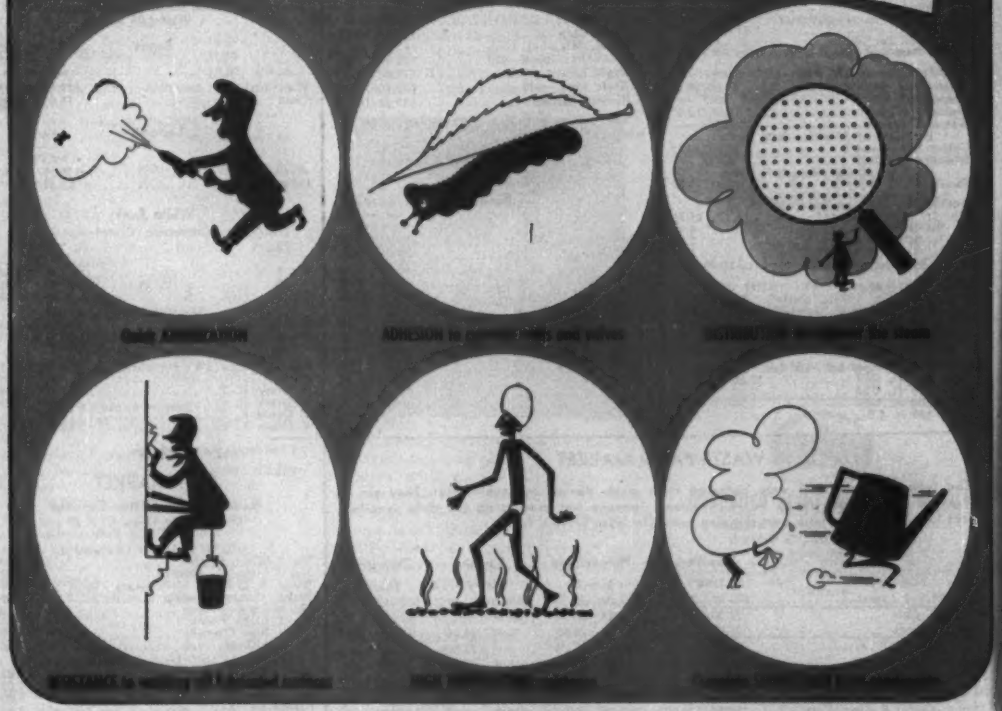
U. S. 2,547,830 — Treating and Refining Machine for Pulp Materials. Charles W. Morden, Portland, Oreg., assignor to Morden Machines Company. Filed January 11, 1947 — Issued April 3, 1951.



In a pulp treating and refining engine of the character described including a conically-shaped rotor having an exterior attritioning surface and a non-rotating shell having an interior attritioning surface surrounding said rotor, a housing located externally of said shell, the large diameter end of said shell spaced free from the inside wall of said housing, supporting means on the outside of said shell, means on the inside of said housing cooperating with said supporting means for supporting said shell in said housing, said supporting means and said cooperating means providing a limited free mounting for the large diameter end of said shell within said housing to enable slight radial movement of the large diameter end of said shell to take place within said housing when such radial movement is required for bringing the attritioning surface of said shell into better cooperating relationship with the attritioning surface of said rotor.

Whatever you need in a Steam Cylinder Oil...

Sinclair has it!



No matter what your operating conditions—pressure, temperature, quality of steam; speed, loading; condensing or non-condensing—there is a Sinclair Steam Cylinder Oil made expressly to give the utmost in lubrication satisfaction.

Through proper combinations of steam cylinder stocks and compounding ingredients, Sinclair lubrication technologists have developed a series of steam cylinder oils to fit the operating needs of any installation. There are oils that provide quick atomization... persistent adhesion to cylinder walls in the presence of moisture... rugged, wear-resisting lubricating films under super-heat . . . or complete separation from condensate where that is the dominating requirement.

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Steam Cylinder Oils
for every steam engine installation

For lubrication counsel see your nearest Supplier of Sinclair Products or write Sinclair Refining Company, 630 Fifth Avenue, New York 20, N. Y.

PRICES

The prices below reflect market quotations in New York at the mill level on standard grades. Does not include spot offerings.

PAPER AND BOARD

Standard News, Delivered Ports
Rolls, contract, per ton $105.00/110.00
Sheets ..... 118.00/ —
F.o.b. Mills. C.l. Frt. allowed, dock, N. Y.

Kraft— per cwt., 40# base wgt.
Standard Wrapping Rolls ..... $7.75/ —
No. 1 Wrapping Rolls 8.35/ 8.50
Standard Bag ..... 7.50/ —

Tissues— per ream 24x36 (480) 10 lbs. 2000 lbs or more
Wh. No. 1 Frd. ..... $1.95 /$2.25
Wh. No. 1 MG ..... 2.10 / 2.40
Wh. No. 1½ ..... 1.85 / 2.15
Wh. No. 2 ..... 1.85 / 2.15
Kraft Anti-Tar 20x30 ..... 1.85 / 2.15
White Anti-Tar 20x30 ..... 1.95 / —

Toilet— per case or 100 rolls—1 M sheets
Unbleached 4½x4½ ..... $8.00/$8.25
Unbleached 4½x5 ..... 6.60/ —
Bleached 4½x4½ 10.00/12.50
Bleached 4½x5 ..... 9.85/ —
Per Case of 50 rolls—2000 sheets
Unbleached 4½x4½ ..... $8.00/$9.75
Bleached 4½x4½ ..... 6.95/ —
Per Case of 100 rolls—1000 sheets
Facial, 4½x5, 2-ply $8.95/10.65

Paper Towels—per case of 3750
Wh. Jr. M'tif'd 9½x9½ $5.75
Br. Sr. M'tif'd 9½x12 ..... 4.10
Br. Jr. M'tif'd 9½x9½ 3.60
Br. Jr. Sgl. fold 9½x10½ 3.65
Bkbd. 7½x11, 24/25 rolls $7.60/7.55

Manila, per cwt.
No. 1 Jute Tag, 100-lb., sheets* .. $19.55/21.55
Reg. Jute M.F. 40-lb., sheets* .. 18.00/20.00
Wrapping Manila 8.75/10.50
Printing Manila 10.50/12.00
* Less usual allowance for rolls.

Gummed Tape—per bdl., 500 bdls. or more
90-lb. 375 ft. GSI ..... $7.20 / —
60-lb. 600 ft. GSI ..... 7.20 / —
35-lb. 800 ft. GSI ..... 8.28 / —
35-lb. 500 ft. GSO ..... 6.31 / —

MARKET WOOD PULP

Second Quarter Contract Prices, Per Short Air-Dry Ton

	Varying freight allowances		Atlantic Ports		
	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	‡$85.00/ 90.00	‡$85.00/100.00			
Sulphate, Bleached	135.00/300.00	190.00/200.00	*$275.00/315.00		*225.00/ —
Sulphate, Unbl. Northn.		145.00/175.00	*250.00/295.00	$300.00/ —	
Sulphate, Unbl. Southn.					
Sulphite, Bkbd. (Sftwd.)	135.00/165.00	160.00/175.00	*275.00/290.00	*225.00/ —	*235.00/ —
Sulfite, Bkbd. (Hdwd.)	155.00/ —				
Sulphite, Unbkbd.		150.00/160.00	*250.00/265.00	*200.00/ —	
Sulphite, Unbl'd (Glassine)		164.00/ —	*252.00/ —		
Soda, Bkbd.	140.00/142.50	155.00/160.00			
Siderums, Pulping News	106.00/ —	106.00/ —			

* On dock. † Delivered. ‡ F.o.b. Shipping Point.

Boards, per ton—
Filled News ..... $107.50/ —
Plain Chip 105.00/107.50
Bkbd. Mla. L-d. Chip ..... 147.50/ —
White Pat. coated .020 ..... 170.00/ —
Kraft Liners 42 lb. 115.00/117.50
Kraft Corr. .009 ..... 122.50/126.00
Binders Boards 137.50/140.00

The following prices are representative distributors' resale prices.

Rag Content Bonds and Ledgers—
White, 20 lb.

Bonds	4 Cms.
	per cwt.
100% Rag Ex. No. 1	$70.45/$75.90
100% Rag	62.65/ —
75% Rag	48.15/ —
50% Rag	38.90/ —
25% Rag	31.65/ 33.00

Ledgers	4 Cms.
	per cwt.
100% Rag Ex. No. 1	$72.65/$72.80
100% Rag	63.90/ —
75% Rag	49.40/ —
50% Rag	40.20/ —
25% Rag	33.00/ 34.30

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds	4 Cms.
	per cwt.
Watermarked	$19.00/$20.50
Plain	18.05/ 19.50

Ledgers	4 Cms.
	per cwt.
Watermarked	$20.30/$21.80
Plain	19.35/ 20.80

White Book

Conversion Coated	Case
	per cwt.
No. 1	$23.40/$24.65
No. 2	21.90/ 23.40
No. 3	20.40/ 22.40
Machine Coated	
No. 1	$18.15/$18.40
No. 2	16.15/ 16.65
Uncoated	
No. 1 Antique (Watermarked)	$18.65/$19.15
Offset	17.40/ 19.90
A Grade E. F.	17.40/ 18.15
A Grade S. C.	18.15/ 18.65
B Grade E. F.	17.65/ —
B Grade S. C.	16.90/ 18.40

† Indicates a price change.

WASTE PAPER MARKET

The following quotations were gathered from major dealers in each market. They are an indication of the price range in which volume tonnage was moving on the date specified. Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.)

	New York	Philadelphia	Boston	Chicago
	June 4	May 28	June 2	June 1
No. 1 Mixed Paper	$20.00/ 21.00	$18.00/ 22.00	$19.00/ 21.00	$20.00/ —
Boxboard Cuts	23.00/ 25.00	17.00/ 20.00	26.00/ —	25.00/ —
Mill Wrappers	25.00/ 30.00	18.00/ 25.00	22.00/ 30.00	22.00/ —
No. 1 News	23.00/ 24.00	20.00/ 22.00	— /22.00	22.00/ —
Over-issue News	30.00/ 35.00	24.00/ 25.00	23.00/ 24.00	25.00/ —
Corrugated Containers	59.00/ 68.00	53.00/ 55.00	56.50/ 58.00	52.00/ —
New Corrugated Cuts	50.00/ 55.00	48.00/ 55.00	55.00/ 65.00	62.00/ —
Double Kraft Ld. Corr. Cuts .. *	115.00/120.00	105.00/120.00	130.00/140.00	120.00/ —
100% Kraft Corr. Cuts ..... *	140.00/160.00	125.00/135.00	130.00/170.00	140.00/ —
Used Kraft Bags ..... *	85.00/ 95.00	80.00/ 85.00	85.00/116.50	65.00/ —
No. 1 Brown Kraft Paper .... *	90.00/ 95.00	85.00/ 95.00	90.00/110.00	65.00/ —
Super Resorted Br. Kraft .... *	100.00/105.00	95.00/105.00	100.00/125.00	90.00/ —
New Br. Kraft Env. Cuts .... *	160.00/180.00	160.00/175.00	160.00/180.00	150.00/ —
New Br. Kraft Cuts ..... *	150.00/170.00	130.00/140.00	150.00/180.00	140.00/ —
No. 1 Gdwd Shvs.	60.00/ 65.00	50.00/ 65.00	75.00/ 85.00	55.00/ —
White Newsblanks	85.00/100.00	80.00/ 90.00	90.00/100.00	80.00/ —
No. 1 Flyleaf Shvs. ..... *	80.00/ 85.00	80.00/ 85.00	95.00/110.00	100.00/ —
No. 1 Soft Wht. Shvs. ..... *	180.00/190.00	170.00/175.00	175.00/195.00	175.00/ —
Super Soft Wht. Shvs. ..... *	190.00/200.00	190.00/200.00	190.00/210.00	185.00/ —
Hd. Wht. Shvs. ..... *	185.00/210.00	190.00/215.00	190.00/215.00	180.00/ —
Hd. Wht. Env. Cuts ..... *	200.00/245.00	200.00/225.00	200.00/235.00	190.00/ —
New Manila Env. Cuts ..... *	140.00/150.00	160.00/165.00	140.00/165.00	115.00/ —
Col. Tab Cards ..... *	110.00/120.00	110.00/120.00	95.00/150.00	100.00/ —
Manila Tab Cards ..... *	170.00/185.00	165.00/190.00	160.00/200.00	165.00/ —
No. 1 Mixed Ledger ..... *	95.00/105.00	90.00/ 95.00	87.00/110.00	100.00/ —
White Ledger ..... *	130.00/140.00	125.00/130.00	125.00/140.00	125.00/ —
No. 1 Book & Mag.†	44.00/ 50.00	30.00/ 40.00	40.00/ 60.00	25.00/ —
No. 1 Rep'd. Hvy. Books‡	50.00/ 55.00	40.00/ 50.00	60.00/ 75.00	50.00/ —

* OPS Ceiling. † Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood.

RAG MARKET

New Domestic Cotton Cuttings
OPS Ceiling Price, CPR 28
Delivered Mill Basis

Add 7½% Dealer Commission

No. 1 White Shirts	$21.00
No. 1 Unbkbd. Muslins	21.00
Bkbd. & Unbkbd. Underwears	21.00
Bkbd. Canton Flannels	21.00
No. 1 Light Silesias	16.00
No. 1 Light Prints	11.50
No. 1 Blue Overalls	14.50
Suntan Khakis	11.50

Add 10% Dealer Commission

Fancy Shirts	$10.00
Indigo Blues	10.00
Mixed Khakis	8.00
Corduroys	8.00
Cottonades	8.00
No. 1 Washables	6.50

Old Domestic Cotton Rags
(Prices to Dealers, f.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$5.00/$5.50
Cotton Pants & Overalls	4.25/ 5.00
Thirds and Blues, Reparked	3.75/ 4.00
No. 1 Roofing Rags	3.10/ 3.25
No. 2 Roofing Rags	2.25/ 2.35
No. 3 & 4 Roofing Rags	2.15/ 2.25
Roofing Bagging	2.15/ 2.25

Bagging
(Prices to Dealers, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$7.50/$7.75
Domestic Gunny, No. 1	$7.50/$7.75
Heavy Wool Tares	8.00/ 8.25
Foreign Manila Rope	8.00/ 8.25
Domestic Manila Rope	7.50/ 8.50
Jute Strings	7.75/ 8.00
No. 1 Sisal Strings	8.00/ 8.25
Paper Mill Tares	5.25/ 5.75
Foreign Scrap Burlap	6.00/ 6.25
Domestic Scrap Burlap	7.00/ 7.50
Austr. Wool Pouches	7.50/ 8.50
New Burlap Cuttings	7.50/ 8.00

MATERIALS

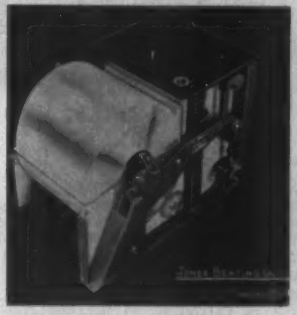
Aluminum, sulfate:		
comm. bags, wks. cwt.	1.85	
iron-free c.l.	3.25	
Alcohol, ethyl:		
tax free, dms. c.l. gal.	1.01	/ 1.05½
deld. East Miss.		
Alcohol, methyl:		
Synthetic, Zone 1, dms. c.l. fir. alld. gal.	.84	
Casein, acid-prec.:		
dom. sh. pt. c.l. lb.	.40	/ .41½
imp. ex. dock lb.	.32½/	.40
Caustic soda:		
c.l. wks. solid, 76%, cwt.	3.35	
flak. & grd. 100-lb. drums	3.75	
liquid 50% tanks	2.55	
liquid 70% tanks	2.65	
China clay:		
dom. air-float. filler, c.l. wks. ton	10.00	
water-washed, lump, filler	11.00	
coating	17.60	/30.50
imported, ex whse. shrt ton	15.20	/28.35
Chlorine:		
single-unit tanks, works cwt.	2.70	
multi-unit cwt.	3.30	/ 4.40
Formaldehyde:		
USP, inh. dms, c.l. wks. lb.	.0625/	.0675
l.c.l., E. wks.	.0675/	.0725
Fuel oil:		
Bunker C, No. 6 Cal. lvy tanks, refinery bbl.	1.95	/ 2.15
light bbl.	2.00	/ 2.25
Hydrogen peroxide:		
USP, 35% cbys. E. of Miss. lb.	.23½/	.26½
Lime:		
aydrated, bags, wks. Buffalo ton	13.50	
Rosin:		
B gum, drms, c.l. Savan. cwt.	8.00	
G, H, I, K cwt.	8.79	/ —
FF, wood, dk. cwt.	7.30	/ —
Rosin size:		
70%, gum & pale grds, tank cars, south, sh. pt. cwt.	6.80	/ 7.00
Salt cake:		
dom. bulk, c.l. wks. ton	17.00	
wks. frt. all. ton	20.00	/22.00
Soda ash:		
light, 58%, bags, wks.	1.30	
bulk cwt.	1.20	
Sodium silicate 40°:		
turbid. c.l. wks. cwt.	1.30	/
l.c.l. wks.	1.60	/ 1.85
Sodium peroxide:		
dms. c.l. E. of Miss. lb.	.21	
l.c.l. do. lb.	.21½/	.22
Soybean, protein:		
chem. leal, wks. c.l. lb.	.24	/ —
Cinn. and Chic.		
Sulfuric acid:		
60° Be. cbys. cl. wks. cwt.	1.75	/ —
l.c.l. wks. cwt.	2.05	/ 2.85
Sulfur:		
crude, c.l. mines, contract, long ton	21.00	/22.00
f.o.b vessels Gulf	22.50	/23.50
Export, f.o.b. Gulf	25.00	
Sulfur dioxide:		
liquid, comm. cyl. wks. lb.	.09	
multi-unit cars lb.	.0535	

Starches:		
pearl corn, bags, c.l. wks. cwt.	6.02	/ —
white dextrines, c.l. wks. cwt.	7.41	/ —
potato, Idaho, c.l. wks. cwt.	5.30	/ —
potato, Maine, c.l. wks. cwt.	5.50	/ —
tapioca, conv. dextrines cwt.	7.75	/ 8.50
low, Siam, on dock N. Y.	5.75	/ 6.00
Talc:	nominal	
domestic, 50-lb. sacks, c.l. wks. ton	25.00	/30.00
Titanium dioxide:		
anastase, c.l. deld., bags lb.	.21	/ .21½
l.c.l. deld. lb.	.22	/ .22½
rutile, c.l. deld. lb.	.23	/ .23½
l.c.l. deld. lb.	.24	/ .24½

NEW EQUIPMENT

Pre-Assembled Beating Unit

The Jones beater is a completely self-contained, pre-packaged unit. Pre-assembled at the factory as a precision instrument, it comes ready for installation with no assembly necessary at the mill. The manufacturer states



that it embodies proven mechanical design, roll and bed plates of the Jones-Bertram with special advantages for conventional tub installations. It can be installed in multiple units for continuous stock treatment, and features positive control of roll pressures and recirculation — which makes it impossible for untreated stock to pass through the unit. If desirable, any roll can be by-passed without shutting down the multi-beater. Available in 200, 300 and 400 h.p.

Cut-Rite Bloc

Cut Rite Bloc is a new cutting block that contains Hycar nitrile type rubber designed for use in cutting soft plastics, fiber, paper, and other products.

Outstanding features of the new product include its fast and economical cutting operation, extra cutting efficiency, and lower costs, it is stated. Cutting noise is noticeably reduced; there is no soiling by sawdust or discoloration of the materials being cut; cutting dies remain sharp for long periods, and do not break; uniform cutting is assured in summer and winter. According to the manufacturer, maintenance of the block is negligible and die replacement is reduced considerably. The Hycar rubber component gives the block its exceptional resistance to oil and grease, provides it with great impact strength, and general all-around durability.

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FRANK C. VAUGHAN

STUDIES, DESIGNS, ESTIMATES, CONSTRUCTION, MANAGEMENT AND OPERATION
for
KRAFT, SODA-CHEMICAL PULP PAPER AND STRUCTURAL BOARD MILLS

RICHMOND, VA.

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FOR UNIFORMITY
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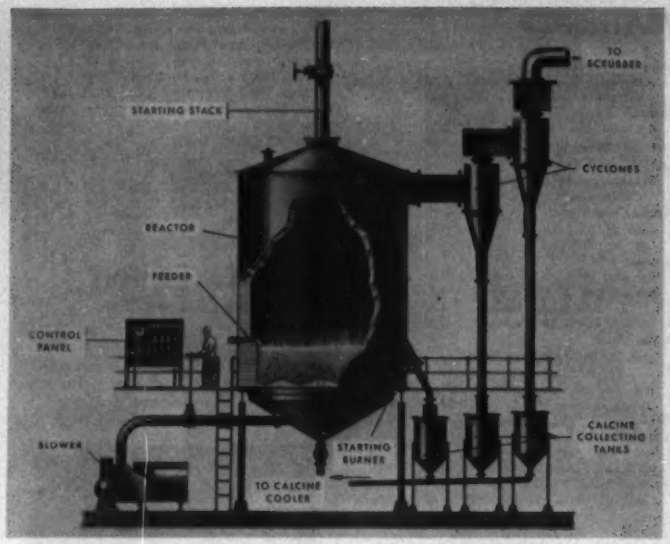


FluoSolids Roasting of Pyrite for SO_2 Production

FluoSolids System

Applicability of the FluoSolids System to the roasting of iron pyrite for the production of SO_2 gas has been announced. Pulp mills faced with curtailment of sulphur supplies will find this method of tapping an alternate source of SO_2 of interest. Either pyrite or pyrrhotite, as flotation concentrates, without further grinding, or massive pyrite or pyrrhotite, crushed to pass approximately 14 mesh, may be self-roasted with this equipment. There are no moving parts within the FS Reactor, and manufacturer claims lower investment and operating costs than with conventional roasting methods. When roasting 48 percent sulphur pyrite at 900°C. with a minimum of excess air, gas strengths up to 14 to 15 percent SO_2 are obtained, and a maximum of 1½ percent total sulphur is left in the calcine. Under these conditions, SO_3 formation is kept to a minimum. With pyrrhotite, gas strength will be up to 12 to 13 percent SO_2, depending upon the analysis of the raw material. Pyrite or pyrrhotite feed may be introduced substantially dry or as a slurry repulped to approximately 80 percent solids, depending upon local conditions. Calcine can be quenched in water for sluicing to waste or process, or caught dry and cooled to handling temperature, as desired. Roasting temperatures are accurately controlled to avoid sintering and to minimize formation of ferrites of base metals, if present. If the calcine is to be used for steel-making, any desired amount of sulphur can be left in the calcine to act as sinter fuel. Or if the copper or zinc content is too high for steel making, the roast can be conducted so as to sulphate the copper and zinc, after which these metals can be leached out to meet desired specifications, it is stated.

Recorder-Controller Instruments

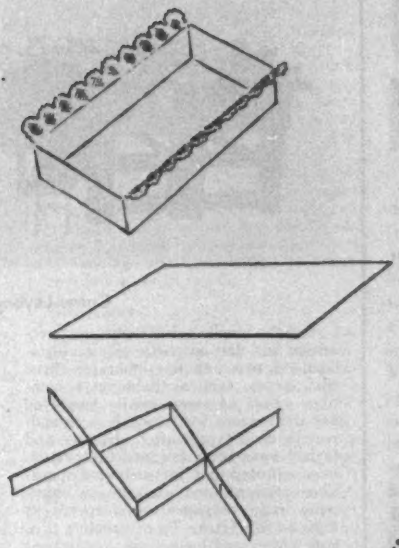
A recommendation that producers of recorder-controller instruments be given interim priority assistance to obtain critical materials until the Controlled Materials Plan becomes fully effective was made by the Recorder-Controller Instruments Industry Advisory Committee at a meeting with NPA.

Immediate assistance is necessary, the committee explained, because current requirements for defense and defense-supporting industries are more than 200 percent higher than during the first half of 1950 and are still climbing.

The committee, which represents 80 percent of the industry, urged that their industry be allowed to use 150 percent of the basic materials consumed during the first quarter of 1951.

Plastic Rubber Base Coatings

Series "F" protective coatings are a 100 percent Plastic Rubber Base Enamel designed for use in corrosive areas. Available in colors for use on metal, masonry or wood, the coatings are described as chemical resistant, elastic, tough and waterproof. The manufacturer states that they can be used over any conventional paints or primers on structural steel, chemical tanks, concrete floors, etc., are mold and fungus resistant, and are unaffected by dilute acid spills or fumes. Can be applied by brush or spray and dry in less than four hours, it is said.



avoid the smell... increase the sell

Manufacturers of packages for candies, foods and confectionery products are offering their customers distinct sales advantages by supplying paper and cardboard boxes that don't smell like paper. They are adding Monsanto flavor and aroma chemicals to their stock to mask undesirable pulp and paper odors and tastes that can be transmitted to the package contents.

The application of these flavor and aroma chemicals is very simple. Since only small quantities are needed, the added cost is trifling by comparison with the added sales advantages that result.

Investigate these increased sales and profit possibilities. For information, contact the nearest Monsanto Sales Office or MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 So. Second St., St. Louis 4, Mo.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

MONSANTO FLAVOR AND AROMA CHEMICALS

ETHAVAN, Monsanto's ethyl vanillin
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METHYL SALICYLATE, U.S.P., synthetic oil of wintergreen
VANILLIN MONSANTO

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MONSANTO
CHEMICALS — PLASTICS

SERVING INDUSTRY... WHICH SERVES MANKIND

NEW EDITION

DICTIONARY OF PAPER

The first edition of the Dictionary of Paper—the "bible" of the pulp and paper industry—is exhausted. A second edition will be off the press about August 1, and will be a sweeping revision. Contains some 4,000 definitions of pulps, raw materials, papers and paperboards, as well as papermaking properties and terms. Thirty per cent of the old terms have been revised and many new terms added. All definitions studied and approved by paper technicians.

Pre-publication price—$5.00 (this offer void after July 1, 1951). Post-publication price —$6.50.

Write—American Paper and Pulp Association, Box 498, Appleton Wisconsin. Money order or check must accompany order. New Dictionary ready about August 1, 1951.

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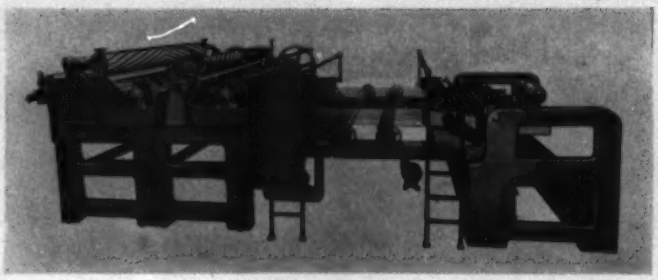


Cutter-Layboy Unit Line

Based on mill studies of cutting operations and for purposes of simplification, the new unit line embraces three basic types, each available in a complete range of sizes usually employed for the service for which it is intended. In each type, cutter, delivery and layboy have been designed to function as a balanced unit for sustained operation with sustained accuracy and minimum broke at paper travel speeds as high as 800 f.p.m. To accomplish this, both cutter and layboy are constructed with heavy cast end frames rigidly tied together by large-section rolled shapes and all shafts turn in anti-friction bearings. In addition to the complete cutter-layboy unit line, there are two new styles of layboy available for use with three types of cutters. The overhanging type of layboy employs heavy cast inverted-L end frames. Skids rest on heavy-wall tubing which is lowered by steel cables operating over pulleys. It piles to a maximum height of 48 ins. In the Vickery-Type layboy, the pile remains stationary, skids resting on floor, while delivery — actuated by hydraulic cylinders — rises as the pile height increases. Type H Unit is designed for high-speed, heavy-duty service on board and multiple sheeting; type C, for high-speed precision single or multiple sheeting in finishing-room service; and type D, for fast, accurate sheeting of wax paper, foil and side-run rolls.

Plastic Protective Coating

The new air-drying plastic protective coating is used to protect tanks, tank cars, pipes, fittings, structural steel parts and chemical processing equipment against attack by splash, drip and spray from corrosive chemicals, corrosive atmospheres, weathering and rust.

Its broadest use will be in chemical processing, rayon and cellophane production, photo finishing, pulp and paper manufacturing, sewage disposal, filtering and electroplating and in mining operations, the manufacturer expects: (It cannot be used in food processing because it imparts a slight odor and taste.) The plastic combines high film flexibility with good adhesion and impact resistance. Will not chip or crack and can be used on steel, aluminum, concrete, hardwood, or composition board. Applied by spray, it requires no primer, and can be produced in a variety of colors, it is stated.

A break in the film can be repaired easily by "touching up" with brush or spray.

Dispersator

A new and revolutionary mixing device, the Simplex Dispersator, was designed for processing operations where propellers are generally ineffective. Operations tested are: building up of emulsions and dispersions, acceleration of chemical reactions, prevention of settling out, speed-up in preparation of solutions.

The Dispersator consists of a cylinder rotating at high speed. The centrifugal force resulting from this high-speed rotation forces the product outwards through narrow slots in the wall of the cylinder under considerable pressure. The effect is two-fold. First, the product is sheared at high speed as it passes through the slots; second, the columns of liquid emerging from the slots are further sheared in coming into contact with the slower moving mass of liquid in the mixing vessel. It is specially designed to produce maximum turbulence and contact between various products, whether they be liquid/liquid, liquid/solid or liquid/gas.

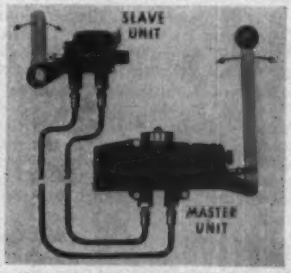
Tape-Strap

Tape Strap presents a fresh concept of package strengthening to supplement the packager's tools, improve his methods, and help prevent pilferage. Its function is to strengthen a package by becoming part of it. That is, the package and reinforcing material are integrated neatly, quickly and effectively into a single working unit. Tape Strap is a unique product. In construction, it consists of a multitude of tough, resilient pliant, shock-resisting fibers, lineally aligned, and laminated between two sheets of kraft paper. One kraft sheet is coated with a high-strength pure animal glue. This construction is designed to combine high strength, both tensile and tear — the tear strength across the fibers ex-

ceeds the range of the standard Elmendorf test; fast, permanent adhesion to a variety of surfaces (boxboard, kraft liner, paper wrapping, etc.); flexibility; excellent shock-resistance; and "Balanced Adhesion" which means a proper balance between all the properties of the glue. Tape Strap has been used for reinforcement of various types of carton closures, it is stated. Bundling of easily damaged materials such as wallboard, printed papers, sensitive papers, etc., have been bundled with Tape Strap, also. Palletizing and unitizing of tires, coils of hose, tubing, etc. Does not require any special techniques or special application machinery.

Hydraulic Remote Control

The complete control system is designed to eliminate bell cranks, rods, linkage, cables, gears, sprockets and chains. Self-contained and compact, it is ideal for manipulation of throttles and other controls, the manufacturer states. Consists of a master unit and a slave unit interconnected by two



small tubes. Motion applied to the actuating lever of the master unit is accurately duplicated by the slave unit lever. It has positive load carrying ability in both directions because its operation is not dependent upon springs, compressed air or valves, it is said. A primary feature provides for expansion and contraction of both fluid and metal due to temperature changes in a manner that guarantees synchronization between master and slave units. An automatic lock in the slave lever provides irreversibility.

NEW MATERIALS

Plastic Floor Patch

Dasco Fast Patch is a fast setting material developed for patching areas where heavy and constant traffic is prevalant. It can be used on any solid or firm surface—concrete, brick, asphalt, etc., the manufacturer states.

When a hole or fracture appears in a busy trucking area apply liberal coat of primer coating with a paint brush or broom, extending the primer two (2) inches beyond patch.

Fill the depression with Dasco Fast Patch and stamp solid. Crown patches slightly for large area and roll with heavy roller after leveling. Sweep dust or sand over the patched area to prevent tackiness.

Tank Lining Patch

Card Flex 6040 is a patch material for rubber linings—a lining material for wood tanks.

Described as flexible, hard, resistant to cracking, it is said to be completely adherent to rubber and wood, more corrosion resistant than either, and of such low shrinkage that patches stay in place. Shelf life is indefinite.

It is readily mixed for use and hardens at room temperature. Drying time is ordinarily 2 to 3 days, but this can be shortened to several hours with additional catalyst and/or the application of heat by infra red lamps or warm circulating air, it is said.

Vinyl Latex

Latex 744-B is a new vinyl latex for use in the paper, textile and paint industries. The result of extensive research on vinyl chloride and vinylidene chloride monomers and their co-polymers, it is now in commercial production. The new latex, is designed to serve both as a functional coating material and as a pigment binder. It gives resistance to moisture, chemicals and grease in functional paper coatings and will produce durable, fire and chemical resistant paints, fabrics and coated wallboard, the company says. It is also weather resistant, a desirable property for tent, awning and tarpaulin coatings, and the new product is finding widespread use for military application in the textile, paint and paper fields.

Copper Ammonium Fluoride Complex

A free-flowing, powdered copper ammonium fluoride complex, soluble in water, is being made available for evaluation purposes.

This product is offered for use as a termite-and-rot-proofing agent and as a mildew-proofing agent, after detailed laboratory tests.

New Wet-Strength Resin

A new approach to the economical production of wet-strength paper is announced with the development of a cationic wet-strength resin of unusual properties. Uformite 700, a nitrogenous resin offers excellent curing characteristics in a variety of pulps over a broad range of resin concentrations in the pulp, the manufacturer states. Whether at high or low levels of concentration, it is said to produce wet tensile strength economically, with rapid development of strength after the paper leaves the paper machine. A major advantage claimed for the new resin is that it requires no special mixing procedures or equipment; it dilutes readily with water and is then ready for use. The new resin appears to perform well on all types of pulp—bleached and unbleached, kraft and sulfite—with no sensitivity to the sulfate ion concentration in the water. The resin produces the maximum wet strength when the pH can be reduced to 4.5 or below, but satisfactory results can be obtained at pH 5.0, it is stated.

CORROSION NOW POSES A DOUBLE THREAT

Worn out and corroded equipment may not be replaceable

Don't take chances on vital equipment. Scarce metals and materials are becoming scarcer. Farsighted business men are rebuilding, repairing and *protecting* to insure continuity of their operations.

Do these two things today:

1. Check up in your plant—manufacturing equipment, piping, valves, tanks, motors, and all similar items.
2. Arrange to protect them with Amercoat—the corrosion-resistant coatings; each designed to meet specialized conditions.

Note: Most conventional coatings fail under severe service conditions. They are neither designed nor suitable for such applications.

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A Division of
American Pipe and Construction Co.
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1-51a

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Apr. 28	May 5	May 12	May 19	May 26
1951	101.5	102.7	102.3	103.0r	104.1
	Apr. 29	**May 6**	**May 13**	**May 20**	**May 27**
1950	93.6	97.5	97.1	97.3	93.3

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	92.6	98.6	96.7	95.4	96.4	97.7	85.3	99.6	96.1	101.0	99.6	93.7‡	95.8‡
1951	99.3	101.5‡	102.3‡	103.1‡									

‡ Preliminary.
r Revised.

COMPARATIVE YEARLY SUMMARIES

	1944	1945	1946	1947	1948	1949	1950	1951
Year to Date	88.3	88.6	99.9	105.3	100.7	89.1	95.6	101.8
Year Average	88.1	89.4	100.1	104.3	96.2	88.6	95.8‡	

PAPERBOARD OPERATING RATIOS†

	Apr. 28	May 5	May 12	May 19	May 26
1951	105	107	104	106	102
	Apr. 29	**May 6**	**May 13**	**May 20**	**May 27**
1950	92	92	93	92	93

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	88	92	91	92	91	94	82	100	96	102	101	93	94
1951	102	105	104	105									

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: The chart shows the ratio through December 1950 on the basis of 6-day capacity. Beginning with January 1951 the ratio is shown on the new basis of normal 6- and 7-day capacities. Corresponding weekly and monthly ratios for 1950 on the new basis, shown in the tables above, are somewhat lower.

Paperboard operating ratios continue on the basis of a 6-day week.

† Per cents of operation based on "inch-hours" reported to the National Paperboard Association.

NEW LITERATURE

Aluminum Co. of America. Booklet, "Alcoa's East St. Louis Research Laboratory." Illustrates and describes one of Alcoa's branch laboratories devoted to the manufacture of industrial chemicals.

American Chain & Cable Co., Inc., P-P&C Valve Div. Sales copy, "Forged Steel Gate Valve." Wright Hoist Div. Sales copy, "Wright Safeway Army Type Trolley Hoist."

American Hoist & Derrick Co. Catalog 300-24. Presents complete line of American Blocks and Sheaves. Includes block number, capacity in tons, number of Sheaves rope size and weight of each block.

Barrett-Cravens Co. Bulletin 5141. Presents improved line of lift trucks in capacities of 1000 to 15,000 lbs. Includes design drawings and specifications.

Corn Industries Research Foundation. Booklet, "The Essentiality of Corn Products to the Armed Forces." Explains how products of corn help the fighting man keep fed, fit, clothed and armed.

Davidson Publishing Co. Book, "1951 Edition of The Paper Year Book," 625 pp., price $10. Represents a complete revision with the addition of many new products, new charts, tables and new information reflecting all of the many changes made in paper and paper products during the past year.

Dun & Bradstreet, Inc. Booklet, "Survival Qualities of American Business," 16 pp. Traces the expansion of business throughout the country by analyzing commercial and industrial failure trends. Features section "Why Do Some Businesses Succeed and Others Fail."

Gordon, Claud S., Co. Bulletin. Highlights new low-temperature, portable pyrometer known as Type LT-840 Xactemp, and the specially designed thermocouples and extension arms available with it.

Paper Cup & Container Institute, Inc., Field Research Div. Manual "Paper Cups and Containers For Hospitals and Institutions." Illustrates their uses. Manual, "Paper Cups and Containers for Restaurants and Fountains."

Johns-Manville. Folder, "Superex Block Insulation." Sales copy and technical data. Provides list of properties, conductivity and heat loss graphs, and recommended thickness table.

Metron Instrument Co. Technical Data Sheet No. 4B Page 1. Describes Type 4B miniature variable-ration speed changer with lever adjustment.

National Information Committee on Lighting. Booklet, "Lighting and the Nation's Welfare," price 25c. Summarizes the vital present-day services of illumination in American industrial production, in public safety, in research and education and in government.

Rotherm Engineering Co., Inc. Catalog 10, "Rotherm Revolving Joints." Provides installation and operating instructions. Also a marked diagram with dimensions.

OBITUARIES

George A. Dobbie, 71, director of Minnesota and Ontario Paper Co., and one of Canada's leading industrialists, died at his home in Galt, Ont., May 24. He is survived by a son and two daughters.

Austin Lee Ely, 61, director of manufacturing for the Kimberly-Clark Corp., Neenah, Wis., died suddenly on May 25 while on his way to work.

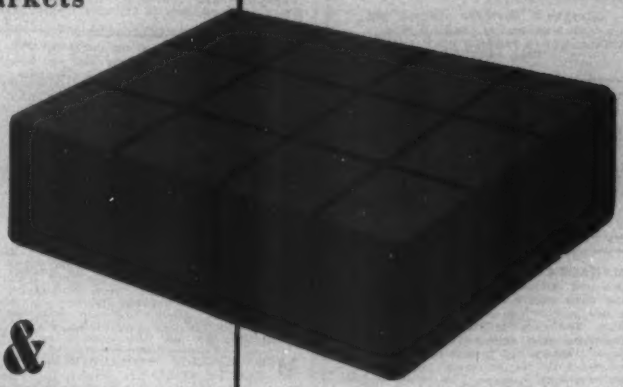
MEISEL MACHINERY IS HELPING IN ALL FIELDS

Cigarette Condenser | Wax Grease Proof | Photographic Snap-out Forms | Jet Propulsion Aero-engine Parts

MEISEL PRESS MFG. CO. 950 Dorchester Ave., Boston

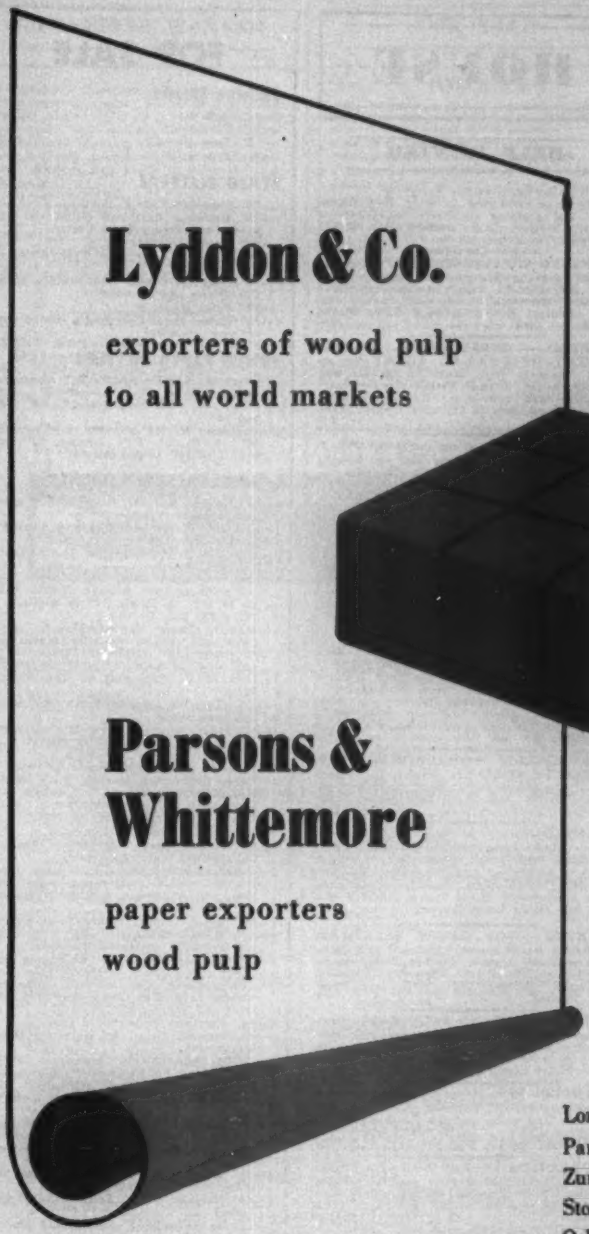
Lyddon & Co.

exporters of wood pulp
to all world markets



Parsons & Whittemore

paper exporters
wood pulp



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10 East 40th Street, New York 16, N.Y.

CLEARING HOUSE

HELP WANTED

MEN WANTED
POSITIONS OPEN

We can place—supt. Fourdrinier mach. mill on specialty papers; executive asst. to pres. for facial and sanitary tissue converting company; chem. or mech. eng. graduate with board mill experience for asst. supt.

Chemists, chemical engineers and laboratory men up to $6,000 year; Cylinder and Fourdrinier mach. foremen; finishing room foreman; electrical, mechanical and plant engineers and asst. engineers; foreman converting plant school papers; salesmen for paper mill machinery; merchandising manager; machine tenders and back tenders.

LIST YOUR CONFIDENTIAL APPLICATION WITH US to keep informed of attractive positions open in the pulp and paper mills.

CHARLES P. RAYMOND SERVICE, INC.
294 Washington St., Boston 8, Mass.
SPECIALISTS IN PLACING PULP AND PAPER MILL EXECUTIVES
J-8

ENGINEERING DRAFTSMEN
OR
MACHINE DESIGNERS

Experienced in paper and pulp mill or heavy machinery. Permanent position. When replying give qualifications and salary desired.

THE APPLETON MACHINE COMPANY
Appleton, Wisconsin
J-22

MANAGER who can supervise the production and sell the output of a plant converting waste papers into high quality pulps by a new and unique process. Applicant must have up-to-date technical knowledge and preferably sales experience in the pulp and paper industry, and possess the qualifications necessary for the successful management of an expanding business. This is an excellent opportunity. Address Box 51-213 care Paper Trade Journal. J-8

We are converters in the Metropolitan area doing a national business in specialties in seven figures. We need a man who is 40-50 years old, is familiar with the essentials of the paper business, particularly the tissue field, more particularly facial and sanitary tissues, who has a creative mind and imagination, has a smattering of advertising and merchandising, who is aggressive and persistent and who is looking for an opportunity to capitalize on his talents. Start as assistant to president. Salary possibilities 12-15 thousand at end of year or two depending on individual. Our people know of this advertisement. Full particulars with your reply please. Box #51-257 care Paper Trade Journal. J-8

SALARIED POSITIONS $3,500 to $35,000. We offer the original personal employment service (established 41 years). Procedure of highest ethical standards in individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. E. W. BIXBY, INC. —117 Dun Bldg., Buffalo, 2, N. Y. TF

PRODUCTION CHIEF

Paper converting, nationally known. Printing, coating, gumming, laminating, finishing operations. Lifetime position for top-flight production executive. Our people know of this ad Send full details confidentially to President, Box 51-272, care Paper Trade Journal. TF

HELP WANTED

WANTED—Experienced Supervisor to take charge of wood yard. In reply, state qualifications and previous employer. Salaried position. Mid-Western Mill. Address Box 51-276 care Paper Trade Journal. J-22

WORKING SUPERINTENDENT for small, fast growing Eastern mill making lightweight specialties. Cylinder machine experience essential. State qualifications and salary expected. Address Box 51-87 care Paper Trade Journal. TF

WANTED — EXPERIENCED, COMPETENT PURCHASING AGENT for an eastern chipboard mill. Must be capable and fully experienced. Furnish details of experience, capabilities and references. Excellent opportunity. Address Box 51-153 care Paper Trade Journal. TF

MODERN up and coming integrated mill in Mid West has opening for an Experienced Paper Mill Superintendent. Splendid opportunity for right man. Good working conditions with good salary. Man must be familiar with water, steam and solution finishes as well as crepe papers. No others need apply. Write Box 51-263 care Paper Trade Journal. J-8

PROJECT ENGINEER—CALIFORNIA. 5 years experience. Processes and machinery for manufacture of floor coverings, wallboards, insulations, building materials. Permanent position. Salary open. Moving expenses allowance. PABCO PRODUCTS INC., 1350 Powell Street, Emeryville, California. Jy-13

WANTED — Machine Tenders and Back Tenders for corrugating medium and liner mill. Fourdinier and cylinder machines. Located in Western Pennsylvania; good working conditions; pleasant surroundings and very good labor relations. Call collect—Tarentum 1470. TARENTUM PRODUCTS CORPORATION, Tarentum, Pa. TF

MID-WESTERN FOURDRINIER SPECIALTY MILL has opening for experienced Production Superintendent. References required. Address Box 51-278 care Paper Trade Journal. A-31

WANTED—Two experienced Machine Tenders; Two experienced Back Tenders; Two experienced third hands. Opportunity for back tenders to qualify for machinetenders. Specialty Kraft Mill, Middle West. Fourdrinier machines. Steady employment. Good wages. Address Box 51-277 care Paper Trade Journal. J-22

WANTED — TOP GRADE SALESMANAGER for an eastern chipboard mill. Fully experienced and capable. Furnish details of experience, capabilities and references. Excellent opportunity. Address Box 51-78 care Paper Trade Journal. TF

PAPER AND BOARD SALESMAN—Established wholesale jobber in Boston has opening for a qualified salesman. Submit complete details in letter of application with photograph to Box 51-288 care Paper Trade Journal. J-15

WANTED—Experienced Trimmer Man to operate Seybold Trimmer. Please state age, experience and when available in first letter to FLOWER CITY TISSUE MILLS CO., 700 Driving Park Avenue, Rochester, 13, N. Y. J-29

PRODUCTION SUPERVISOR—For Eastern Wax Paper Manufacturer familiar with all operations. State qualifications, age, salary. Confidential. Address Box 51-289 care Paper Trade Journal. J-29

SITUATIONS WANTED

EXECUTIVE ACCOUNTANT

Capable, cost minded administrative executive, age 40, available immediately. Fully experienced in multi-plant paperboard, folding carton and printing industry. Box 51-197 Paper Trade Journal. J-8

FOR SALE

Cameron Slitters

1—52" Type 8-S.
1—32" Type 40-2A.
1—42" Type 40-1-AF.
1—42" Type 26-2A.

OTHER SLITTERS

1—84" Langston Type B.
1—52" Knowlton Combined Slitter and Rewinder and Rotary Sheet Cutter.
1—60" Hammerly Score Cut.
1—30" & 1—40" Langston Type A Shear Cut S & R.
1—42" Langston Center Wind Duplex Shear Cut Slitter and Rewinder.
1—30" Fales Model B.
1—32" Hobbs Shear Cut, double rewind slitter and rewinder.

POWER PAPER CUTTERS

12—Seybold, 1—74", 10ZD, 20th Centurys, 44", 54" & 64" & 74", 1—(6" & 1—40" 10Z, 1—40" 6Z. Holyokes, 24", 44", 48" and 54".
3—Oswegos; 38", 44" and 57"; 1—Sheridan, 50"; 1—Dexter, 57"; 2-Acme, 32" and 42"; 1—S&W Under Cut 63".

MISCELLANEOUS MACHINES

1—64" Creping machine, complete with automatic Kohler system.
Several Die Presses, Seybold and Sheridan, various sizes.
1—Hudson-Sharp #4 special Tissue Paper Folder.
Schultz Automatic Wax Paper cutter box roll machine Type AX-103, rewinds rolls up to 128" in length 12" in width.
1—72" x 42" Erie Layboy.
1—Modern Clipper Bag Machine for cellophane and pliofilm materials. Makes flat or gusset bags, single or duplex, range 1¼" to 9" in width, 3" to 27" in length.
1—New 24"-2 color, Roll to Roll Aniline Press.
1—72" Type A, Hudson-Sharp Automatic collapsing reel.
1—84" Miami lo-type Waxing Machine, manufactured by Dilts Machine Works with 1 refrigerating unit size 4" x 4".
2—Potdevin Waxing Machines, 82" wide.
1—Paper Converting Machine Co.'s Model No. 215, three web, ¼ fold napkin machine with embossing attachment.
1—Dexter Co.'s File Folder Machine.
1—77" Paper Towel Roll Converter.
2—81" Toilet Paper Converters, suitable for standard and facial tissue.
2—Brand new 81" Diets, very latest type, friction rewind combination toilet and towel roll convertors. Automatic counters and stop motions.
1—64" Dillon Duplex Rotary Sheet Cutter.
1—42" Hobbs Embosser, with Vickers 20 ton hydraulic pressure attachment.
1—49" German Dornbusch Embossing machine with 2 sets of embossing rolls.
1—38" Holyoke Roll to Roll Embosser, Heavy Type. Two extra new rolls, one steel and one paper.
1—45" Robinson Rotary Card Cuter.
1—40 Norwood Plater, AC Reversing Motor Equipment.
1—20" Champlain 4 color Rotogravure Press.
1—116" Model 29 Hamblet Duplex Rotary Sheet Cutter, slitting attachment, Erie automatic layboy and twelve roll backstands.
1—74" Hamblet Duplex Rotary Sheet Cutter, slitting attachment, 8 roll backstands, Moore & White layboy, 15 HP Reliance Drive.
1—55" nine roll Holyoke Super Calender stack with AC motor equipment.
1—46" Holyoke, 6 Roll, Stack of Super Calenders.
1—Staude, "Champion" folding and glueing machine.
1—40" Parry Liner, 11 roll type. New 1949. Never used.
1—74" wide Hudson-Sharp Duplexing machine #298, 3 coating units, including asphalt.

GIBBS-BROWER CO., INC.

Please address reply to Room 962
21 East 40th Street, New York 16, N.Y.
Telephone Lexington 2-5759

SITUATIONS WANTED

CHEMIST—Experienced in mill operations, supervision of quality control in the manufacture of test liner, all grades of boxboard, corrugated and specialty items. Successful developments indicate ability in directing research. Fully qualified to head a laboratory staff. Address Box 51-265 care Paper Trade Journal. J-8

CHEMICAL ENGINEER—B.S. Degree. 10 years experience in kraft pulp and paper industry. Desires position in South Central States. Address Box 51-264 care Paper Trade Journal. J-15

PLANT MANAGER—Paper and Board and their conversion; wants challenging opportunity. Highly successful in organization; administration; labor relations and high level production. Presently employed. Address Box 51-63 care Paper Trade Journal. J-39

FOR SALE

FOR SALE

Motor driven stack directly connected by Waldron flexible coupling with herringbone gear reduction drive & Kohler system electric hookup.

0 roll stack (Holyoke) 90" wide.
1 bottom steel roll 10" dia. with 10" journal.
3 intermediate steel rolls 12" dia. with 6" journals.
3 cotton rolls—14" dia.
1 paper roll—14" dia.
1 steel top roll 10" dia.

Water cooled bearings.

Web frame 17" between guides so intermediate rolls can be removed through side.

Compound levers and weights.

2 shaft hand revolving rewinder to take 30" dia. roll. Drive consists of D.C. Right 75 H.P. Motor 220 V with Cutler Hammer, magnetic clutch and Kohler system for variable speed.

Address Box 51-185 care Paper Trade Journal J-8

FOR SALE—1—122" Heavy Duty Single Knife Horne Cutter, suitable for Board or Pulp. Address Box 51-275 care Paper Trade Journal. TF

FOR SALE

FOR SALE

WAXING MACHINE with Reserve Tank—75" width. $3000.00. One 75" DOUBLE DRUM—for cutting paper from rolls. $250.00.

BLEYCO PAPER CORP.
419 West 55th Street, N.Y.C. 19
Plaza 7-6380

J-8

FOR SALE—68" Moore & White Sheeter with Flayboy; 68" & 72" Rewinders. Address Box 51-273 care Paper Trade Journal. J-8

ROSS PAPER MACHINERY CO

MACHINERY WANTED FOR OUTRIGHT PURCHASE

Paper Machines, Pulp and Paper Mill Machinery and Converting Equipment.

BEATERS
3—Dilts 700 lb. Iron Tub. Roll 44" face x 30" diameter.
1—Downingtown 1000 lb. Iron Tub. New roll 48" face x 49" diameter.

BELTING—NEW
37 feet 5" 13 ply Goodyear Rubber Belting.
180 feet 8" 4 ply Silver Duck Transmission belt.

CALENDER ROLLS
46 Chilled Iron Rolls—Assorted sizes.

CALENDER STACKS
1—3 roll—82".
1—3 roll—62". All rolls bored for steam.
1—Laddell 5 roll 124" Calender Stack, with dexters and drives.
1—Farrel Birmingham 110" Calender Stack with dexters. 2 rolls bored for steam.

COMBINING MACHINE
1—Black Clawson 54" Combining Machine with 1—48" diameter and 1—34" diameter Dryers. Motor, pumps, tanks, etc. Complete.

CONVEYOR
1—18½ ft. long x 30" wide—with motor.

CORE CUTTERS
1—Cameron with 2" x 1½" mandrels.

CYLINDER MOLDS
1—134" face x 30" diameter, with stainless steel shafts.

DRIVES—ENCLOSED HERRING BONE GEAR
2—Falk right angle 75 hp—ratio 6.31-1.
1—Falk straight 100 hp—ratio 1.67-1.
1—Falk straight 150 hp—ratio 2.12-1.

DRYERS
3—124" face x 48" diameter.
2—96" face x 36" diameter.
1—77" face x 48" diameter—with gear.
1—120" face x 19" diameter—Baby Dryer.
1—66" face x 36" diameter.
1—152" face x 48" diameter, with bearings.
2—100" face x 60" diameter—with gears and bearings.
9—110" face x 42" diameter with bearings and gears.
1—172" face x 48" diameter.
1—108" face x 42" diameter Creping Dryer.
4—52" face x 36" diameter, with frames, gears and bearings.
10—48" face x 48" diameter, with gears, bearings and steam joints.

EXTRACTOR ROLLS
1—Downingtown Extractor Roll 106" face x 24" diameter. Anti friction bearings.
1—Downingtown Extractor Roll 128" face x 24" diameter. Anti friction bearings.

FILTER PRESS
1—New Sperry filter press, size 12, type 41.

FILTERS
2—Oliver Vacuum Filters. Cylinder 10' face x 9'6" diameter. Steel vat. 1200 GPM capacity.

FLAT SCREENS
2—4 plate Sandy Hill Roller Shoe with scrapers.
1—Norwood 12 plate.
2—Sandy Hill 12 plate roller shoe.
4—Bagley & Sewall 6 plate, with scrapers and plates.

JORDANS
1—60 Bliss, for motor drive.
1—Jones Majestic with base and couplings—
1—23 Appleton with base and couplings.
1— Jones Majestic. Stainless Steel Fitting.

MOTORS
1—Allis Chalmers 30 h.p. 440 v. 900 r.p.m.
1—Allis Chalmers 25 h.p. 440 v. 900 r.p.m.
25 others 440 v. motors from 2 h.p. to 15 h.p.

PULP EQUIPMENT
1—Mills & Merrill #17 Pulpwood chipper.
1—Bird ball bearing Pulp Screen. Practically new. Used 6 months.
4—AP&W Ball Bearing Pulp Screens—90 ton capacity.

PULPERS
2—#2 Lamoyo.

PUMPS
44—Centrifugal Pumps, open & closed impellers. Direct connected or Belt Driven. Extended base for motor. Assorted capacities and heads. Most used less than one year. Also new Goulds Pumps.

REDUCERS
1—Link Belt 40 h.p. Ratio 2.3-1. 300 r.p.m.-127 r.p.m.

ROLLS—PRESS, COUCH, etc.
20—Press rolls, brass and rubber covered.
14—Couch rolls, brass and rubber covered.
250—Brass and steel carrying rolls.

ROTARY SCREENS
4—#2A Bird, fully rebuilt with new vats, plates, etc. Enclosed drive.
1—#2 Bird—stainless steel vat.

SAVEALLS
2—Oliver, Vacuum type, cylinder 120" face x 60" diameter, with steel vat.

SCREW PRESSES
1—Valley Voith Screw Press Size 2.

SHEETERS
1—28" Kidder Spot Sheeter.
1—84" Duplex Dilion with 15 roll Pack Stand.

SHOWERS
2—Brooklyn Oscillating Showers for 110" machine.

SHREDDERS
1—American 20" Hammermill, anti-friction bearings.
1—Jeffrey 30½" Knives—7 knife rotor—4 knife bed plate. Ball bearing.

SLITTERS AND WINDERS
1—Beloit 120" Paper Machine Slitter and Rewinder—42" rewind.
1—Hudson Sharp 68" Wax roll slitter and rewinder.

STEAM TURBINES
1—De Laval 225 h.p. Initial pressure 140 p.s.i. Exhaust pressure 50 p.s.i. Complete with gear reducer.
1—De Laval Variable speed—375 h.p. at 150 steam and 30 p.s.i. exhaust. Complete with gear reducer.

STOCK PUMPS
1—Sherlie 12 x 20 Duplex.
1—Sherlie 10 x 20 Single Plunger Pump.

STOCK REGULATORS
2—Brett Stock Regulators.

SUCTION COUCH ROLLS
1—Millspaugh 22" diameter x 130½" suction face.

SUCTION PRESS ROLLS
1—Millspaugh 151" drilled face x 22" diameter with stand & drive.
1—Mandeville 80" drilled face x 14" diameter.

THICKENER
1—Woods Thickener with anti friction bearing. Cyclo Jor 40" diameter x 132" face.

TOILET TISSUE PERFORATOR
1—Paper Converting Machine Co. automatic 81" Perforator, slitter and Winder—with three motors—ball bearing.

TRANSFORMER
1—General Electric outdoor 2500 KVA, 3 phase, 12000 to 480 volts.

TRIMMER
1—57" Soybold with motor and 7 knives.

VACUUM PUMPS
1—Nash H-4 Vacuum Pumps

WATER FINISH UNIT
1—Valley Micronist Unit for water finish on paper—120" double.

WAXING MACHINES
1—84" Potdevin complete from lot off to single roll rewind section.
1—89" Special—complete from 2 roll lot off to single roll rewind.

WHY LIST YOUR EQUIPMENT? — WE WILL BUY IT.

FOR SALE

Beaters

1—Jones broke beater 2000 lbs. Stainless steel bars and tub, excellent condition, new in 1943
2—75 x 55" Rabus, bronze filled
1—62 x 56", iron tub Valley Iron Wks
1—Broke beater 72 x 54", with rag catcher

Calenders (Machine)

1—114" nine roll
1—96" seven roll
1—92" nine roll
1—80" seven roll

Calenders (Super)

1—94" eleven roll Norwood with speed range 50—2000 FPM with M G set, excellent condition.
1—82" nine roll Norwood
1—72" nine Roll Holyoke
1—55" nine roll Holyoke

Cutters

1—156" Hamblet duplex
1—130" Hamblet duplex
1—100" Dillon duplex
1—84" Clark single
1—70" Clarke single

Chippers

1—84" four knife Carthage chipper

Dryers

1—12 ft. x 184" Yankee
2—8 ft. x 184"
6—5 ft. x 174"
1—5 ft. x 103" Yankee

Digester

3—14 ft. diameter Globe

Drives

1—20 HP Downingtown spiral bevel gear drive
1—30 HP Rice Barton spiral bevel gear drive

Grinders

1—100" Hanchett
1—40" grinder

Presses (Pulp)

4—Thune presses for de-watering pulp

Rolls (Press)

3—32 x 232" rubber covered
1—25 x 162"
1—26 x 236, granite

Rolls (Suction)

1—36 x 240" suction couch
1—30 x 103" suction couch
1—22 x 130" suction couch
1—18 x 142" suction couch
1—34 x 200" suction press
1—30 x 190" suction press

Screens

4—Waterous Quiller type pulp screens
2—16 plate Harmon flat screens

Slitters & Winders

1—208" Moore & White four drum winder
1—190" No. 19 Cameron
1—120" Moore & White four drum winder

Mill

1—2 Machine Mill—Capacity 25 ton Kraft

FRANK H. DAVIS COMPANY
175 Richdale Ave.
Cambridge 40, Mass.
J-18

FOR SALE

2—Wet Machines complete with single press.
1—Cylinder 40" x 80".
1—Cylinder 36" x 72".
1—Bagley & Sewall Dryer 24" Dia. x 130" face.
4—High Pressure Dryers 32" Dia. x 120" face. Good for 150# pressure.
5—Pusey & Jones Dryers 48" Dia. x 160" face.
1—Sturtevant Bale Pulper, antifriction bearings.
1—Dilts Continuous Breaker Beater, Cast Iron tub, bandless roll, spring cushion bearings. Good for 100 tons.
1—Emerson No. 2 Jordan, Bronze Fillings, Full length base for Direct Connecting.
1—Bird No. 5 Savveall, Cast Iron End Vat, Cylinder 42" x 100".
4—Bagley & Sewall 12 Plate Flat Screens.
4—Packer 10 Plate Flat Screens.
1—Bagley & Sewall 6 Plate Flat Screens.
2—Bagley & Sewall 4 Plate Tailing Screens.
5—8 x 6 Open Impeller Centrifugal Stock Pumps.
1—Pusey & Jones 6 x 4 Open Impeller Centrifugal Pump.
1—Cameron No. 6 Double Suction Centrifugal Stock Pump.
1—Gould 10S, 3250 GPM, 75' head centrifugal Pump.
1—Gould 6 x 2S, 1000 GPM, 231' head Centrifugal Pump.
2—Warren 8" SOD 17, 1000 GPM, 18' head Centrifugal Pump.
2—12 x 18 Black Clawson Triplex Stock Pump.
1—8 x 16 Duplex Stock Pump.
1—Rubber Covered Press Roll 20" Dia. x 156" Face.
1—Granite Press Roll 20" Dia. x 128" Face.
7—Rubber Covered Couch Rolls 20" Dia. x 110" Face. 2" New Rubber, 220 Plastometer, Immediate Shipment.
3—Rubber Covered Wringer Rolls 19½" Dia. x 120" Face.
4—Rubber Covered Squeeze Rolls 12" Dia. x 112" Face with ¾" New Rubber Covering.
5—Rubber Covered Wringer Rolls 14" Dia. x 120" Face.
1—Top Roll for Extractor 18" Dia., 112" Face.
1—110" Two Drum Langston Type Winder, antifriction bearing, rolls up to 50" dia., with motor.
1—112" Two Drum Cameron Type Winder.
1—Waterbury Variable Speed Drive, 40 H.P.
1—G.E. Steam Turbine Type D-59, 60 H.P. Inlet Pressure 100#. Direct Connected to Falk Reducer, 3650 RPM to 691 RPM.
1—Sturtevant #8 Monogram Blower.

OSBORNE PAPER MILL EQUIPMENT CORP.
FULTON, N. Y. TEL. 54
J-8

FOR SALE

Forty (40) used open top Wooden Tanks, 10' D. x 8' high, complete with steel stands, wood dunnage, steel hoops and tightening lugs. Capacity 4,960 gals. Can be utilized for white water, stock chests, etc. Priced at 30% of new cost. Box. No. 51-292 Care Paper Trade Journal.
J-8

FOR SALE—Cady Paper Testing Scale and Cambridge Moisture Indicator. Like new. Both $75. Address Box 51-221 care Paper Trade Journal. J-8

FOR SALE—One Hudson Sharp 81" Winder Drum Type. Will run towels 11" x 7½", 11" x 13" and 11" x 13½"—and toilet tissue 4½" x 4½" x 5". Address Box 51-248 care Paper Trade Journal. J-8

FOR SALE

FOR SALE
1—40" Rotary Kidder 2 color Printing Press—Prints with Sank dies—$7500.00
1—40" Kidder Spot Gutter with 10 sheet Accumulator—$2500.00
1—36" Book Sheeter—$2000.00
1—42" Paper Rewinder—$1000.00
S. B. BEHRENS & COMPANY,
143 Underdonk Ave., Brooklyn, N. Y.
Phone EVergreen 8-9606.
J-8

GOVERNMENT BIDS

PROPOSALS

FOR FURNISHING

PAPER AND ENVELOPES FOR THE U. S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 a.m., E.D.S.T., June 11, 1951, in the room of the Joint Committee on Printing, in the Capitol, Washington, D. C., for furnishing the paper for the public printing and binding, and blank paper and plain envelopes for the use of the Government departments and establishments in the District of Columbia, for the terms of 3 months for paper and 6 months for envelopes beginning July 1, 1951, deliveries to be f.o.b. Government Printing Office Warehouse, or warehouse siding, Washington, D. C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposals. The Committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedule, and specifications may be obtained by addressing John J. Deviny, Public Printer, Washington, D. C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 15 of the proposal for paper and paragraph 13 of the proposal for envelopes.

The approximate estimated quantities set forth in detail in the schedules comprise:

PAPER

4,000,000 pounds newsprint paper; 1,255,000 pounds machine-finish book paper; 20,000 pounds machine-finish book paper; 250,000 pounds english-finish book paper; 3,500,000 pounds offset book paper; 225,000 pounds antique book paper; 100,000 pounds water resistant (text) book paper; 670,000 pounds supercalendered book paper; 1,740,000 pounds coated bonk paper; 1,050,000 pounds mimeograph paper; 135,000 pounds duplicate copy paper; 9,275,000 pounds writing paper; 1,376,000 pounds map paper; 385,000 pounds manifold paper; 3,035,000 pounds bond paper; 1,255,000 pounds ledger paper; 680,000 pounds index paper; 130,000 pounds cover paper; 18,000 sheets cloth-lined paper; 40,000 pounds manila paper; 340,000 pounds kraft paper; 300,000 sheets gummed paper; 50,000 pounds blotting paper; 115,000 pounds tag board; 10,000 pounds manila cardboard; 10,000 sheets white lithe-coated one side cardboard; 50,000 sheets railroad board; 200,000 pounds wood cardboard; 120,000 pounds tan board; 7,620,000 pounds postal and paper; 10,000 sheets pressboard; 200,000 pounds newsboard; 65,000 pounds binder's board; 220,000 pounds chestnut cover board.

In cases where more than 1,000 reams are called for, proposals wil lbe received for 1,000 reams or more.

ENVELOPES

The approximate estimated quantities set forth in detail in the schedule comprise:

19,450,000 Kraft; 9,150,000 Writing, Chemical Wood, white and colored; 190,000 100% Writing, White; 355,000 25% Bond, White; 485,000 100% Bond, White.

By direction of the Joint Committee on Printing.

JOHN J. DEVINY,
Public Printer.

WASHINGTON, D. C.,
May 21, 1951.
J-8

FOR SALE
60" Trim—Board Machine

5—Cylinder wet end complete with a Downingtown extractor.

3—Primary presses complete.

3—Main presses complete.
Complete dryer section of 60 dryers arranged triple deck.

3—Calender stacks—one 5 and one 7 roll.

1—M & W duplex cutter.

7—Bevel mortise gear drives and three helper drives. Complete line shaft and earings.

2—Flat screens with scrapers.

5—Beavertail fan pumps.

3—Plunger pumps.

1—Nash vacuum pump.

This machine can be inspected in operation and will be available after June 15, 1951.

SHARTLE BROTHERS MACHINE COMPANY
Middletown, Ohio

J-15

REBUILT ELECTRICAL MACHINERY

AC MOTORS (3 ph. 60 cy.)

HP	Make	Wdg	Spd.	Type
1200	G.E.	S.C.	277	HT
600	G.E.	S.C.	600	HT
500	G.E.	S.C.	450	HT
300	G.E.	S.C.	600	I M
300	Al.Ch.	Wnd.	600	
150	G.E.	S.C.	600	LK
150	G.E.	S.C.	900	AY
125	Westgh.	Wnd.	585	S Brg.
125	West.	Wnd.	277	
100	G.E.	S.C.	450	I M
100	Al.Ch.	S.C.	450	ABS
100	West.	S.C.	1200	CS
75	West.	S.C.	900	CS
75	G.E.	S.C.	720	FYL
50	West.	S.C.	1750	CS
30	Al.Ch.	S.C.	900	AS
25	West.	S.C.	1725(Enc.)	CS405
25	G.E.	S.C.	1150	I K
20	Vert. G.E.	S.C.	1150	KT328
20	GW V. West.	S.C.	1750	CS355
20	Gr.Wh.	S.C.	850	
20	West.	S.C.	1750	CS

HP	Make	Wdg	Spd.	Type
20	West.	S.C.	1200	CS
20	Al. Ch. (new)	S.C.	(Hi-Torq) 1695	ARWHN
20	West.	S.C.	1725	CS
15	West.	S.C.	1750	CS355
10(S)	Al.Ch.	S.C.	575	ABY
10	West.	S.C.	1200	CS275C
7½(S)	Al.Ch.	S.C.	575	ABY
7½	G.E.	S.C.	1200	KT
7½	West.	S.C.	3450	CS254Y
5	West.	S.C.	1200	CS
5/11½ A.		S.C.	550/1050	2WS
5	Reader	S.C.	1135/57	FA
5	Burke	S.C.	420	KW2
3	West.	S.C.	1750	CS254
3 200v. West.		S.C.	1750	

TRANSFORMERS

KVA	MAKE	PRI.	SEC.
1—1000 (3 PH)	G.E.	25000	2200Y
1—500	West.	22000	2300
1—500	Al.Ch.	22000	2300
1—25	West.	2400	120/240

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42" Cameron 26-2A Slitter, like new.
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45" Hamblet Sheeter.
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Four 3A-100" Bird Screens non-ferrous construction with 24 cut bronze screen plates, front and skimming boxes, copper dam, high pressure cleaning showers and 440 volt, 3 phase, 60 cycle motors. In operation approximately two years. In excellent condition. Contact Weyerhaeuser Timber Company, Purchasing Department, P. O. Box 275, Springfield, Oregon.

J-22

FOR SALE

Brand new #102 Potdevin flat and square bag machine latest model, ¼ to 6 lbs., ex. Brooklyn warehouse. Complete with formers, motor and Reeves drive. Will sell under cost. Could also consider change for aniline printer, receiving difference. Omega, Box 230, Quito, Ecuador, S.A. J-8

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COMBINING MACHINE—1 Black Clawson Combining Machine with 4—49" diameter and 1—24" diameter dryers. Motor, pumps, tanks, etc. Complete.

ROSS PAPER MACHINERY COMPANY
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Tel. HUmboldt 3-3177 J-8

FOR SALE

2—Brand new 81" Diets, very latest type, friction rewind combination toilet and towel roll converters, V-Belt drive. AC 3 phase, 60 c. 220 V. motors. Automatic counters and stop motion. Perforations 4½" x 4½" and 4½" x 5½" toilet rolls. Towels 11" wide, perforations 7½", 13½" and 19". In original crates. Immediate delivery. Address Box 51-196 care Paper Trade Journal. J-8

FOR SALE—Stack Super Calender takes 45" rolls suitable for glassine and embossing. Address Box 51-231 care Paper Trade Journal. J-22

FOR SALE—3—Schultz rewinders available for immediate delivery. Used—in excellent condition. Address Box 51-290 care Paper Trade Journal. J-15

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PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon Laboratory Coating and Treating and Flat Resin Measuring and Converting Machines. New improvement. THE MAYER MACHINE COMPANY, INC., 1313 Buffalo Road, Rochester, 11, N. Y. TF

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40 LB. BAG PAPER PREFERRED
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1—16 x 124	1—16 x 80
3—10½ x 124	1—14 x 80
2—14 x 87	1—12 x 80
2—12 x 87	1—14 x 76
1—16 x 84	3—12 x 76
3—7½ x 84	1—14 x 64

CALENDER STACK—1—Calender stack, available July.—93 to 98" face.

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2—36 x 92½.

DRIVES—8—Bagley & Sewell mortise gear drives. Now on paper machine, will be available July.

DRIVES—1—Philadelphia gear drive made by Downingtown in 1946, 4:1 ratio, 22 HP, antifriction bearings, cone pulley, etc. Regular paper machine drive.

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1—36 x 88" dryer.

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2—Shartle Miami agi-flow pumps, 1800 gpm, 1150 rpm, 120 ft. heads, 22" outlet, 100 HP.
1—Stock Pump 6 x 8.
1—#3 Nash Hytor pump.
2—#4 Nash Hytor pumps.

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J-8

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2—#400 FV 36" Bauer Double Revolving Disc Pulpers, complete, and in good condition for operation on 440 volt, 3 phase, 60 cycle current.

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WANTED

WANTED—W & P Shredders, Evaporators, Generators and Boilers. Slitters, Cutters. Hydraulic presses, Sheridan Presses, Dryers. Address Box 51-89 care Paper Trade Journal. TF

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Simonds Saw & Steel Co.

BRIERS
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Black Clawson Company
Downingtown Mfg. Co.
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Lakewood
The Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Rod-Ray Mfg. Co., Inc.
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

BRILLED SUCTION COUCH ROLLS
Manchester Machine Co.

BRILLED SUCTION BRUM ROLLS
Manchester Machine Co.

BRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Bird Machine Co.
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Farrel-Birmingham Co.
General Electric Company
Gibbs-Brower Company, Inc.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Stephens-Adamson Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

BRUM WINBERS
Manchester Machine Co.

BRYER BRAINAGE
Stickle Steam Specialties Co.

BRYER ROLL PYROMETER
Thwing-Albert Instrument Co.

BUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
M. W. Jenkins Sons, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
John Waldron Corp.

BUSTING BRUSHES
M. W. Jenkins Sons, Inc.

BYESTUFFS
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Bunge Pulp & Paper Co.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuffs Corp.
National Aniline Division, Allied Chemical & Dye Corp.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

EMBOSSING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
John Waldron Corp.

EMBOSSING ROLLS
The Appleton Machine Co.
Gibbs-Brower Company, Inc.
Holyoke Machine Co.
Northern Engraving & Mch. Co
B. F. Perkins & Son, Inc.
John Waldron Corp.
Wheeler Roll Co.

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General Dyestuff Corp
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp

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Rohm & Haas Co.
Vanderbilt Co., R. T.

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FANS
General Electric Co.
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Ross Engineering Co., J. O.

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Merrick Scale Mfg. Co.
The Permutit Company
Stephens-Adamson Mfg. Co.

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Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mercy Paper Mill Supply Co.
Shuler & Benningfield
Waterbury Felt Co.
Waterbury, H., & Sons Co.
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FELT CLEANERS
Calgon, Inc.
General Dyestuff Corp.
Nopco Chemical Co.

FELT CONBITIONERS
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The Sandy Hill Iron & Brass Works

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Moore & White Co.
J. O. Ross Engrg. Corp.
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Walworth Company

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Crane Company
Shartle Bros. Mch. Co.
Walworth Company

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Williams Apparatus Co., Inc.

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The Moore & White Co.
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The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co

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Black Clawson Company
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Egan, Frank W., & Co.
The Sandy Hill Iron & Brass Works

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Ross Engineering Corp., J. O.
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Valley Iron Works Co.

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Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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B. F. Goodrich Chemical Co.

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Beloit Iron Works
Johnson Corp.
Lovejoy Flexible Coupling Co.
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Shartle Bros. Mch. Co.
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Valley Iron Works Co.

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Valley Iron Works Co.
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Williams Apparatus Co., Inc.

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Lobdell Co.
Stephens-Adamson Mfg. Co.
Testing Machines, Inc.

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Moore & Munger
Sun Oil Company

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Stickle Steam Specialties Co.
Williams Apparatus Co., Inc.

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General Electric Company
Reliance Electric & Engrg. Co.

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The International Nickel Co.

NOZZLES
Spray Engrg. Co.

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Industrial Truck Division
Johnson Corporation
The Moore & White Co.
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Industrial Truck Division

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Manchester Machine Co.

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Bagley & Sewall Co.
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Monsanto Chemical Company
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B. F. Goodrich Chemical Co.
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Nopco Chemical Co.

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Perkins & Son, Inc., B. F.

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Babcock & Wilcox Co.
J. O. Ross Engrg. Corp.
Lukenweld Division
Lukens Steel Company
Timken Roller Bearing Co

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Black Clawson Company
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

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Manchester Machine Co.

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Testing Machines, Inc.
Thwing-Albert Instrument Co.

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General Dyestuff Corp.

PRESS ROLLS
Beloit Iron Works

PRESSURE FILTERS
Holyoke Machine Co.

PRESSURE VESSELS
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.

PRESSES
Black Clawson Company
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
The Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.
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The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Buffalo Pumps, Inc.
Byron Jackson Co.
DeLaval Steam Turbine Co
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Gibbs-Brower Company, Inc.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Roots Connersville Blower Corp
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co

RADIANT BURNERS
Red-Ray Mfg. Co., Inc.

RAG COOKING PROCESSES
The Kinsley Chemical Company
General Dyestuff Corp.
Rohm & Haas Co.

RAG CUTTERS
Gibbs-Brower Company, Inc.
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

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Babcock & Wilcox Co.
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.
Moore & White Co.
D. J. Murray Mfg. Co.
Posey & Jones Corp.
Ross Engineering Corp., J. O.
Valley Iron Works Co.

REELS
The Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works (Kohler Systems)
Egan, Frank W., & Co.
Downingtown Mfg. Co.
Moore & White Co.
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout Waldron & Co., Inc.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
APMEW, Inc.
Allis-Chalmers Mfg. Co.
Bird Machine Company
General Electric Co.
Johnson Corp.
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Taylor Instrument Companies

RESINS
American Cyanamid Company, Plastics & Resins Division
The Dow Chemical Company
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Plaskon Division, Libbey-Owens-Ford Glass Co.
Reichhold Chemicals, Inc.
Rohm & Haas Co., Resinous Products Div.

ROLLS
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Holyoke Machine Co.
Lobdell United Co.
The Moore & White Co.
D. J. Murray Mfg. Co.
Perkins, B. F., & Sons Co
Posey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co
U. S. Rubber Co.
Valley Iron Works Co.
Waldron Corp., John
Wheeler Roll Co.

ROLL COVERS
The Goodyear Tire & Rubber Company

ROLL HANDLING EQUIPMENT
Dilts Machine Works (Kohler Systems)

ROLL STANDS
Cameron Machine Co.
Dilts Machine Works (Kohler Systems)
Frank W. Egan & Co.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
John Waldron Corp.
H. G. Weber & Co., Inc.

ROPE CARRIERS
Black Clawson Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works

ROTARY KILNS
F. L. Smidth & Co.

ROTARY STEAM JOINTS
Johnson Corp.
The Moore & White Co.
Shartle Bros. Mch. Co.

RUBBER PRODUCTS
The Goodyear Tire & Rubber Company

SATURANTS
B. F. Goodrich Chemical Co

SATURATING MACHINES
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co
Waldron Corp., John
Weber, Herman G.

SAVEALLS
Bird Machine Company
Chicago Bridge & Iron Co

SAWS
Simonds Saw & Steel Co.

SCALES
Fairbanks, Morse & Co.
Merrick Scale Mfg. Co
Testing Machines, Inc.

SCREEN PLATES
Bird Machine Company
Fitchburg Screen Plate Co
Magnus Metal Corp.
Morey Paper Mill Supply Co
Testing Machines, Inc.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Company
The Bagley & Sewall Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Stephens-Adamson Mfg. Co.
Valley Iron Works Co.

SHEET MACHINES
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Valley Iron Works Co.
Williams Apparatus Co., Inc.

SHEETERS
Jagenberg-Werke Akt. Ges.

SHOWER PIPES
Bird Machine Company
Downingtown Mfg. Co.
Moore & White Co.
Sandusky Fdy. & Mch. Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
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Gibbs-Brower Company, Inc.

SIZE PRESSES
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Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Stein-Hall Co., Inc.
Wyandotte Chemicals Corp., Michigan Alkali Div.

SIZING TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Williams Apparatus Co., Inc.

SLIME CONTROL
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E. I. du Pont de Nemours & Co.
General Dyestuff Corp.
Monsanto Chemical Co.
National Aluminate Corp.
Rohm & Haas Co.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

SLITTERS
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Black Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Clark-Aiken Co.
Dietz Machine Works
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co., Inc.
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Potdevin Machine Co.
J. J. Ross Company
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Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
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Dietz Machine Works
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Jagenberg-Werke Akt. Ges.
Langston Co., Samuel M.
Moore & White Co.
Potdevin Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

WINDING ROLL CHANGERS
Dilts Machine Works (Kohler Systems)
Egan, Frank W., & Co.

WIRE BRUSHES
M. W. Jenkins Sons, Inc.
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WIRES
Appleton Wire Works
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Williams-Gray Co.

WOOD CHIP ELEVATORS
Stephens-Adamson Mfg. Co.

WOOD SPLITTERS
The Appleton Machine Co.
Carthage Machine Co.
The Permutit Company

INDEX TO ADVERTISERS

A

Adams, R. P., Co. —
Alpha Cellulose Corp. 31
Allis-Chalmers Mfg. Co. 3
American Cyanamid Co., Calco Chemicals Div. —
Americoat Corp. 35
American Cyanamid Co., Industrial Chemicals Div. —
American Defibrator, Inc. —
American Pulp & Paper Assn. 34
American Steel & Wire Co. —
Ansul Chemical Co. —
Apsen, Inc. —
Appleton Machine Co., The —
Appleton Wire Works, Inc. 8
Appleton Woolen Mills 31
Armco Drainage & Metal Products —
Armco Steel Corp. —
Asten-Hill Mfg. Co. —

B

Babcock & Wilcox Co. —
Bagley & Sewall Co. —
Bahr Bros. Mfg. Co. —
Bailey Meter Co. —
Bareco Oil Co. —
Bauer Bros. Co. —
Beloit Iron Works —
Bird Machine Co. 15
Birk, F. Paul —
Bixby, R. W., Inc. —
Black-Clawson Co. 6
Blaw-Knox Co. 46
Bowsher, N. P., Co. —
Brown Co. —
Brown Instrument Div., Minneapolis-Honeywell Reg. Co. —
Bulkley, Dunton Pulp Co. —
Bunge Pulp & Paper Co. —
Byron Jackson Co. —

C

Cambridge Instrument Co. —
Cameron Machine Co. —
Canadian Newsprint Supply Co. —
Carnegie-Illinois Steel Corp. 10
Carthage Machine Co. 31
Chemipulp Process, Inc. —
Chicago Bridge & Iron Co. —
Ciba Co. —
Clark-Aiken Co. —
Clark Equipment Co. —
Classified Advertising 38
Cleveland Crane & Engrg. Co. —
Clinton Foods, Inc. —
Columbia Steel Co. —
Combustion Engineering - Superheater, Inc. —
Corn Products Sales Co. —
Crane Co. —
Crucible Steel Corp. of America 21

D

Deitz Machine Works —
De Laval Steam Turbine Co. —
Diamond Alkali Co. —
Dilts Machine Works 6
Dodge Manfg. Corp. 32
Dow Chemical Co. —
Downingtown Mfg. Co. —
Draco Corp. —
Draper Brothers Co. —
du Pont, E. I., de Nemours & Co. Electrochemicals Dept. —
du Pont, E. I., de Nemours & Co. Dyestuffs Dept. —
du Pont, E. I., de Nemours & Co. Grasselli Chem. Dept. —
du Pont, E. I., de Nemours & Co. Polychemicals Dept. —
Duriron Co., The —

E

Ebasco Services, Inc. —
Egan, Frank, & Co. —
Elixman Paper Core Co. —
Elwell Parker Elec. Co. —
English China Clays Sales Corp. —

F

Fairbanks, Morse & Co. —
Farrel-Birmingham Co., Inc. —
Ferguson, The H. K., Co. —
Fitchburg Screen Plate Co. —

G

Geigy Co. 31
General Dyestuff Corp. —
General Electric Co. —
Gibbs-Brower Co. 38
Glidden Co. —
Goodrich Co., B. F. —
Goodrich Chemical Co. —
Goodyear Tire & Rubber Co. Back Cover
Goslin-Birmingham Mfg. Co. —
Gotham Ink & Color Co. —
Gottesman & Co. —
Graphic Arts Inst. Corp. —
Grinnell Co., Inc. —
Gulf Oil Corp. —
Gurley, W. & L. E. —

H

Hagan Corp. (Calgon, Inc.) —
Hall, Thomas W., Co. 39
Hamblet Machine Co. —
Harris-Seybold Co. —
Heppenstall Co. —
Hercules Powder Co. —
Heyden Chemical Co., Aktivin Div. —
Hofft Co., Inc. —
Holyoke Machine Co. —
Hooker Electrochemical Co. —
Huber Feltex Co. —
Huber, J. M., Corp. —
Hubinger Co., The —
Hungerford & Terry, Inc. —
Huyck, F. C., & Sons —

I

International Nickel Co. —
International Wire Works 31

J

Jackson & Church Co. —
Jeffrey Mfg. Co. —
Jenkins, M. W., Sons, Inc. —
Johnson Corp., The —
Johnson, Alvin H., & Co. —
Jones, E. D., & Sons Co. —

K

Kalamazoo Tank & Silo Co. —
Kidder, Peabody & Co. —
Kinzley Chemical Co. 32
Knox Woolen Co. —
Koppers Co., Inc. —

L

Langston, Samuel M., Co. —
Lindsay Wire Weaving Co. 44
Lobdell-United Co. 25
Lockport Felt Co. —
Lodding Engineering Co. —
Lovejoy Flexible Coupling Co. —
Lukens Steel Co. —
Lyddon Co. 37
Lynch Corp. —

M

Magnus Metal Div., Nat. Lead Co. —
Main, Charles T., Inc. 31
Manchester Machine Co. —
Marietta Concrete Corp. —
McBride, Edward J., Company —
Mead Sales Co., The —
Meincke, A. M., & Son 31
Meisel Press Mfg. Co. 36
Merrick Scale Co. —
Michigan Steel Casting Co. 32
Mixing Equipment Co. 51
Monsanto Chemical Co. 33
Montague Machine Co. —
Moore & Munger Co. 45
Moore & White Co. —
Moorhead Electrical Machinery Co. 41
Morden Machines Co. —
Morey Paper Mill Supply Co. 2
Morningstar, Nicol, Inc. —
Mount Hope Machinery Co. —
Murray, D. J., Mfg. Co. —

N

Nash Engineering Co. —
National Adhesives —
National Aluminate Corp. 52
National Aniline Div., Allied Chem. & Dye Corp. —
National Starch Products, Inc. —
National Tube Co. 10
Naugatuck Chem. Div., U. S. Rubber Co. —
Niagara Alkali Co. —
Nichols Engrg. & Research Co. 31
Nopco Chemical Co. —
Northern Engraving & Mch. Co. —
Norton Co. —

O

Oldbury Electro Chemical Co. —

P

Paper & Industrial Appliances —
Parsons & Whittemore 37
Peabody Engrg. Co. —
Perkins, B. F., & Son Co. —
Perkins Goodwin Co. —
Permutit Co., The —
Photovolt Corp. —
Pittsburgh Plate Glass Co. —
Plaskon Div., Libbey-Owens-Ford —
Poirier Control Co. —
Potdevin Machine Co. 48
Powell, William, Co. —
Price & Pierce, Ltd. 47
Pulp & Paper Trading Co. —
Pusey & Jones Corp., The —

R

Railway Supply & Mfg. Co. 46
Raymond, Chas. P., Service, Inc. 38
Record Fdy. & Machine Co. —
Red Ray Manufacturing Co., Inc. —
Reichhold Chemicals, Inc. —
Reidel, Gus, & Son —
Reliance Elec. & Engrg. Co. —
Research Corp. —
Restigouche Co., Ltd. —
Rice Barton Research Corp. —
Rogers, S. C., & Co. —
Rohm & Haas Co. —
Roots-Connersville Blower Corp. —
Ross, J. J., Co. —
Ross, J. O., Engrg. Corp. —
Ross Paper Machinery Co. 39
Rust Engineering Co. —

S

Sandusky Fdy. & Mch. Co. —
Sandy Hill Iron & Brass Works —
Seaboard Air Line R.R. Co. —
Shartle Brothers Machine Co. 6
Shuler & Benninghofen —
Simonds Saw & Steel Co. —
Sinclair Refining Co. 29
Sirrine, J. E., Co. 42
SKF Industries —
Smidth, F. L., & Co. —
Smith & Winchester Mfg. Co. —
Socony Vacuum Oil Co., Inc. —
Sonoco Products Co. —
Spray Engineering Co. —
Sprout, Waldron & Co., Inc. —
Squier Corp., The —
Stebbins Engrg. & Mfg. Co. —
Stein, Hall & Co., Inc. —
Stephens Adamson Mfg. Co. —
Stickle Steam Specialties Co. —
Stowe Woodward Inc. —
Sun Oil Co. —
Sutherland Refiner Corp. —
Swenson Evaporator Co. Front Cover

T

Taylor Instrument Co. —
Taylor Stiles & Co. —
Tennessee Coal, Iron & R. R. Co. 10
Testing Machines, Inc. —
Texas Co., The 4
Texas Gulf Sulphur Co. —
Thwing-Albert Instrument Co. —
Tide Water Assoc. Oil Co. 17
Timken Roller Bearing Co. —
Tissue Converting Corp. —
Titanium Pigment Corp. —
Towmotor Corp. —

U

United Carbon Co., Inc. 44
U. S. Rubber Co. 27
U. S. Steel Corp. 10
United States Steel Export Co. 10
United States Steel Supply Co. 10

V

Valley Iron Works Co. —
Vanderbilt, R. T., Co. —
Vaughan, Frank C. 32
Virginia Smelting Co. 43

W

Waldron, John, Corp. —
Walworth Co. —
Waterbury Felt Co. —
Waterbury, H., & Sons Co., Inc. —
Weber, H. G., & Co., Inc. —
Wellman Engineering Co. —
Western Gear Works —
Western Precipitation Corp. —
West Virginia Pulp & Paper Co. 49
Weyerhaeuser Timber Co. —
Wheeler Rolt Co. 45
Whiting Corp. Front Cover
Williams Apparatus Co. —
Williams Gray Company —
Worthington Pump & Mach. Corp. —
Wyandotte Chemicals Corp. —

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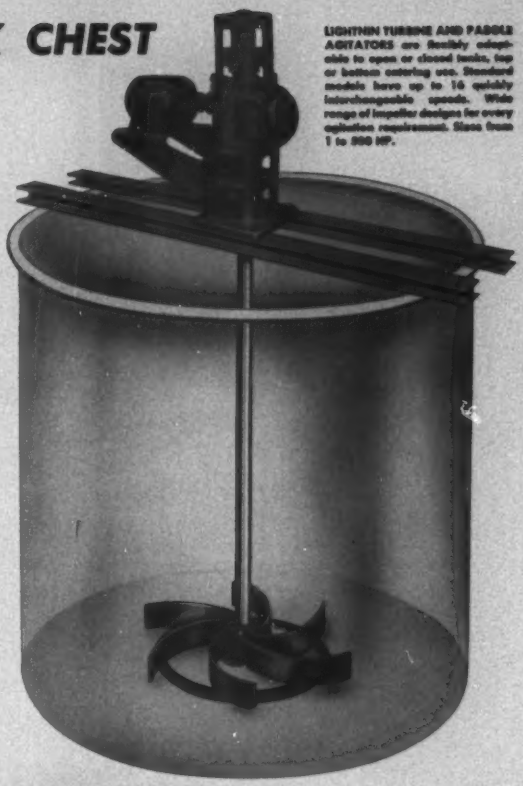

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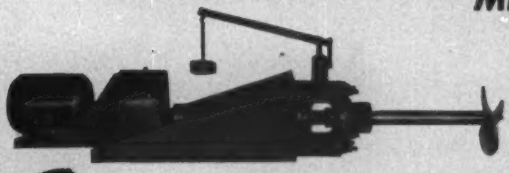

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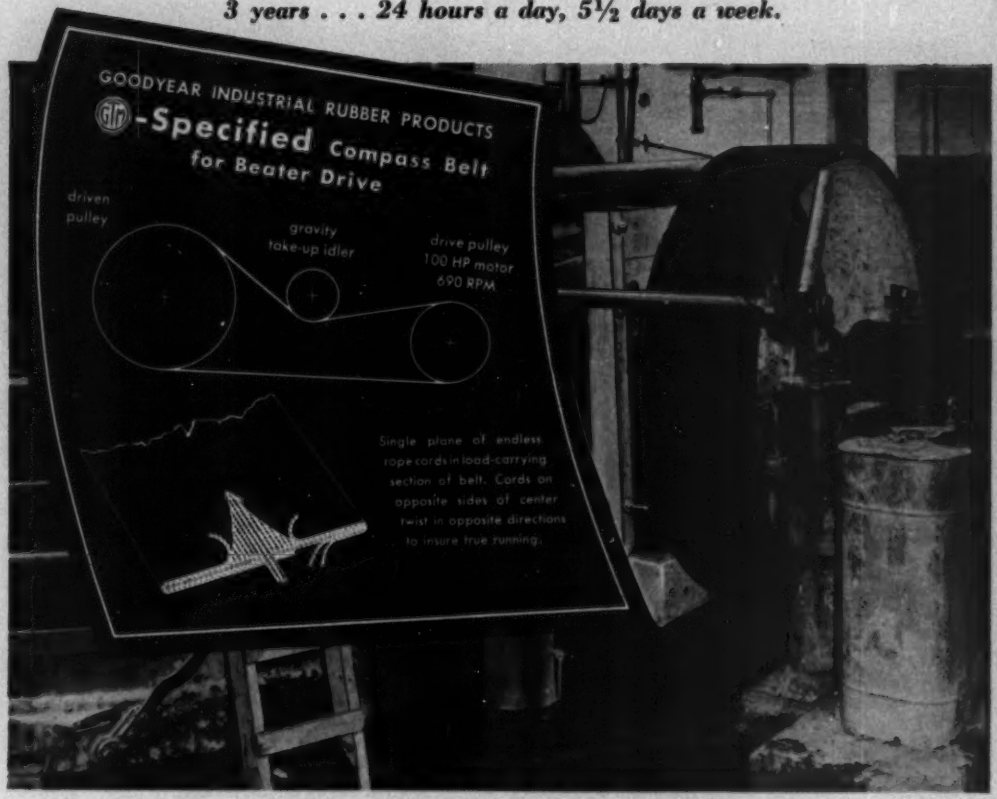
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